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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
HELIUM ACTIVITY
HELIUM RESEARCH CENTER
INTERNAL REPORT

COMPRESSIBILITY DATA FOR HELIUM AT 0° C AND PRESSURES TO 800
ATMOSPHERES FITTED TO AN EQUATION OF THE FORM

$$Z_r = 1 + BP_r + CP_r^2 + DP_r^3 + EP_r^4$$

BY

Ted C. Briggs

BRANCH

Fundamental Research

PROJECT NO.

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INTRODUCTION

Twenty-two compressibility runs were made with helium at 0° C. Data from the twenty-two runs were fitted to equation (3) by a non-linear least-squares technique. Later data were fitted to equation

$$Z = 1 + B_1 P + B_2 P^2 + \left(\frac{B_3}{P}\right) + \left(\frac{B_4}{P^2}\right) + \left(\frac{B_5}{P^3}\right) \quad (4)$$

1/ Bureau of Mines, Bureau Research Center, Bureau of Mines, Washington, D.C.

2/ Additional values in parentheses refer to those in the first column of the end of this report.

COMPRESSIBILITY DATA FOR HELIUM AT 0° C AND PRESSURES TO
800 ATMOSPHERES FITTED TO AN EQUATION OF THE FORM

$$Z_r = 1 + BP_r + CP_r^2 + DP_r^3 + EP_r^4$$

by

Ted C. Briggs^{1/}

ABSTRACT

The 0° C helium compressibility data of Helium Research Center Internal Report No. 88 (3)^{2/} were fitted to an equation of the form $Z_r = 1 + BP_r + CP_r^2 + DP_r^3 + EP_r^4$ by using a non-linear least squares technique. Results of fitting the data to the equation $Z_r = 1 + BP_r + CP_r^2 + DP_r^3 + EP_r^4$ are recorded in this report, and the results are compared with the data treatment of Helium Research Center Internal Reports No. 88 (3) and No. 97 (4).

INTRODUCTION

Twenty-two compressibility runs were made with helium at 0° C. Data from the twenty-two runs were fitted to equation (1) by a non-linear least squares technique. Later they were fitted to equation

$$Z_r = 1 + BP_r + CP_r^2 = \left(\frac{Z_o}{P_o}\right) f_r N^r P_r \quad (1)$$

^{1/} Research chemist, Helium Research Center, Bureau of Mines, Amarillo, Tex.

^{2/} Underlined numbers in parentheses refer to items in the list of references at the end of this report.

Z_r = compressibility factor at P_r

P_r = pressure after the r th expansion

B = constant evaluated from the experimental pressures

C = constant evaluated from the experimental pressures

P_o = pressure before the first expansion

$r = R$ = expansion number

Z_o = compressibility factor at P_o

f_r = factor to correct for elastic pressure distortion
of the compressibility bombs

N = isothermal volume ratio at zero pressure

(2) by using a non-linear least squares method.

$$Z_r = 1 + BP_r + CP_r^2 + DP_r^3 = \left(\frac{Z_o}{P_o}\right) f_r N^r P_r \quad (2)$$

D = constant evaluated from the experimental pressures

A description of the experimental apparatus and experimental procedure used to obtain data for the twenty-two runs, treatment of the experimental observations, and results of the least squares fitting of the data to equation (1) are recorded in Helium Research Center Internal Report No. 88 (3).

The pressure residuals obtained when the data were fitted to equation (1) were not random in sign; therefore, the data were fitted to equation (2).

Results of fitting the 0° C helium compressibility data to equation (2) are recorded in Helium Research Center Internal Report No. 97 (4).

Fitting the data to equation (2) gave smaller pressure residuals than fitting the data to equation (1), and some randomness of the signs of the pressure residuals resulted.

The same experimental pressures for the twenty-two helium compressibility runs at 0° C were fitted to equation (3) by using a non-linear least squares method.

$$Z_r = 1 + BP_r + CP_r^2 + DP_r^3 + EP_r^4 = \left(\frac{Z_o}{P_o}\right) f_r N^r P_r \quad (3)$$

E = constant evaluated from the experimental pressures

Details of a non-linear least squares treatment of compressibility data obtained by the Burnett method are recorded in Helium Research Center Internal Reports No. 85 (2) and No. 86 (1).

The extensive numerical calculations required for the data treatment were carried out by the Branch of Automatic Data Processing by using an IBM 1401 computer. Results of the computer calculations were printed directly on multilith masters to minimize typing and proofreading time.

RESULTS OF FITTING THE 0° C HELIUM COMPRESSIBILITY DATA TO EQUATION (3)

The pressure expansion numbers are listed in table 1 under the column heading R. Experimental pressures in absolute atmospheres, calculated pressures in absolute atmospheres, differences between the experimental pressures and the least squares calculated pressures, and relative differences between the experimental and calculated pressures are recorded in table 1 for each of the twenty-two compressibility runs. The quantities are listed in "E format." The

TABLE 1. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES,
CONSTANTS, STANDARD ERRORS, VARIANCES,
AND COVARIANCES

RUN NO. HE-0-1

R	P, OBS., ATM.	P, CAL., ATM.	P, OBS. - P, CAL.	$\frac{P, OBS. - P, CAL.}{P, OBS.}$
0	6.4728895E+02	6.4728895E+02	0.000000E-99	0.000000E-99
1	2.8125289E+02	2.8125289E+02	-3.10027E-07	-1.10230E-09
2	1.3168470E+02	1.3168469E+02	8.89343E-06	6.75358E-08
3	6.3853510E+01	6.3853599E+01	-8.92556E-05	-1.39781E-06
4	3.1491659E+01	3.1491307E+01	3.52235E-04	1.11850E-05
5	1.5661273E+01	1.5661743E+01	-4.70106E-04	-3.00171E-05
6	7.8217009E-00	7.8218401E-00	-1.39262E-04	-1.78046E-05
7	3.9151145E-00	3.9146104E-00	5.04102E-04	1.28758E-04

SUM OF WEIGHTED SQUARES OF THE RESIDUALS 6.26628E-07

CONSTANTS AND STANDARD ERRORS

N	1.993907636E-00	SN	1.37824E-04
B	5.442457752E-04	SB	5.27147E-06
C	-1.229438189E-07	SC	3.41732E-08
D	1.701054526E-10	SD	9.62086E-11
E	-1.309133164E-13	SE	8.33819E-14

VARIANCES AND COVARIANCES

S2N	1.89955E-08
S2B	2.77884E-11
S2C	1.16781E-15
S2D	9.25610E-21
S2E	6.95254E-27
S2BC	-1.78934E-13
S2BD	5.00120E-16
S2BE	-4.31636E-19
S2BN	-7.04797E-10
S2CD	-3.28339E-18
S2CE	2.84140E-21
S2CN	4.41600E-12
S2DE	-8.01983E-24
S2DN	-1.22012E-14
S2EN	1.04763E-17

TABLE 1. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES, CONSTANTS, STANDARD ERRORS, VARIANCES, AND COVARIANCES

Run No. HE-0-1

R	P, ATM.	P, CAL., ATM.	P, CAL., P, CAL.	P, CAL., P, CAL.
0	0.4138822E-02	0.4138822E-02	0.00000E-00	0.00000E-00
1	3.8125898E-03	3.8125898E-03	-3.1001E-03	-1.10330E-02
2	1.3168470E-02	1.3168470E-02	8.8713E-04	0.7332E-03
3	0.382310E-01	0.382310E-01	-8.0522E-02	-1.3918E-04
4	3.1481629E-01	3.1481629E-01	1.5233E-04	1.1180E-02
5	1.2661273E-01	1.2661273E-01	-4.7010E-04	-3.0017E-02
6	1.8517009E-00	1.8517009E-00	-1.3925E-04	-1.7604E-02
7	3.6121145E-00	3.6121145E-00	2.0410E-04	1.5078E-04

SUM OF WEIGHTED SQUARES OF THE RESIDUALS 0.2622E-01

CONSTANTS AND STANDARD ERRORS

E	1.3013316E-13	SE	8.3381E-14
C	1.7010425E-10	SD	9.6308E-11
C	-1.23343818E-07	SC	3.4135E-08
B	2.44242725E-04	SB	2.5714E-06
B	1.99390733E-00	SB	1.8784E-04

VARIANCES AND COVARIANCES

25B	1.0473E-14
25C	-1.2501E-14
25D	-8.0199E-24
25E	6.4160E-13
25F	5.8416E-21
25G	-3.5833E-18
25H	-7.0479E-10
25I	-4.3143E-10
25J	2.0015E-18
25K	-1.7893E-13
25L	0.9224E-23
25M	9.2261E-21
25N	1.1078E-12
25O	5.7788E-11
25P	1.8692E-08

TABLE 1. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES,
CONSTANTS, STANDARD ERRORS, VARIANCES,
AND COVARIANCES

RUN NO. HE-0-2

R	P, OBS., ATM.	P, CAL., ATM.	P, OBS. - P, CAL.	$\frac{P, OBS. - P, CAL.}{P, OBS.}$
0	6.9039330E&02	6.9039330E&02	0.00000E-99	0.00000E-99
1	2.9760733E&02	2.9760733E&02	-1.27490E-07	-4.28384E-10
2	1.3883415E&02	1.3883415E&02	3.62962E-06	2.61436E-08
3	6.7203083E&01	6.7203118E&01	-3.46987E-05	-5.16326E-07
4	3.3114887E&01	3.3114770E&01	1.17541E-04	3.54949E-06
5	1.6462213E&01	1.6462271E&01	-5.75478E-05	-3.49575E-06
6	8.2197040E-00	8.2200381E-00	-3.34143E-04	-4.06514E-05
7	4.1139611E-00	4.1135559E-00	4.05218E-04	9.84984E-05

SUM OF WEIGHTED SQUARES OF THE RESIDUALS 2.94198E-07

CONSTANTS AND STANDARD ERRORS

N	1.993847041E-00	SN	8.96063E-05
B	5.459438040E-04	SB	3.25202E-06
C	-1.305281275E-07	SC	1.99319E-08
D	1.826261734E-10	SD	5.30164E-11
E	-1.341058719E-13	SE	4.32631E-14

VARIANCES AND COVARIANCES

S2N	8.02929E-09
S2B	1.05756E-11
S2C	3.97281E-16
S2D	2.81074E-21
S2E	1.87170E-27
S2BC	-6.43838E-14
S2BD	1.70024E-16
S2BE	-1.38174E-19
S2BN	-2.82684E-10
S2CD	-1.05533E-18
S2CE	8.59925E-22
S2CN	1.67456E-12
S2DE	-2.29303E-24
S2DN	-4.37179E-15
S2EN	3.53478E-18

TABLE 1. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES,
CONSTANTS, STANDARD ERRORS, VARIANCES,
AND COVARIANCES

RUN NO. HE-0-3

R	P,OBS.,ATM.	P,CAL.,ATM.	P,OBS.-P,CAL.	$\frac{P,OBS.-P,CAL.}{P,OBS.}$
0	7.0128236E&02	7.0128236E&02	0.00000E-99	0.00000E-99
1	3.0170799E&02	3.0170799E&02	-3.11473E-07	-1.03236E-09
2	1.4061376E&02	1.4061375E&02	9.01525E-06	6.41136E-08
3	6.8033559E&01	6.8033648E&01	-8.88393E-05	-1.30581E-06
4	3.3517320E&01	3.3516993E&01	3.27031E-04	9.75708E-06
5	1.6660572E&01	1.6660882E&01	-3.10864E-04	-1.86587E-05
6	8.3186011E-00	8.3190967E-00	-4.95617E-04	-5.95794E-05
7	4.1639855E-00	4.1632145E-00	7.71023E-04	1.85164E-04

SUM OF WEIGHTED SQUARES OF THE RESIDUALS 1.05167E-06

CONSTANTS AND STANDARD ERRORS

N	1.993735046E-00	SN	1.67284E-04
B	5.481542673E-04	SB	5.99580E-06
C	-1.368157143E-07	SC	3.62518E-08
D	1.926748371E-10	SD	9.51093E-11
E	-1.394484374E-13	SE	7.64879E-14

VARIANCES AND COVARIANCES

S2N	2.79839E-08
S2B	3.59496E-11
S2C	1.31419E-15
S2D	9.04578E-21
S2E	5.85040E-27
S2BC	-2.15899E-13
S2BD	5.62368E-16
S2BE	-4.50408E-19
S2BN	-9.73002E-10
S2CD	-3.44337E-18
S2CE	2.76516E-21
S2CN	5.68590E-12
S2DE	-7.27275E-24
S2DN	-1.46420E-14
S2EN	1.16675E-17

TABLE 1. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES,
CONSTANTS, STANDARD ERRORS, VARIANCES,
AND COVARIANCES

RUN NO. HE-0-4

R	P, OBS., ATM.	P, CAL., ATM.	P, OBS. - P, CAL.	$\frac{P, OBS. - P, CAL.}{P, OBS.}$
0	7.0574520E&02	7.0574520E&02	0.000000E-99	0.000000E-99
1	3.0337137E&02	3.0337137E&02	6.05811E-09	1.99693E-11
2	1.4133952E&02	1.4133952E&02	-1.22794E-07	-8.68789E-10
3	6.8373652E&01	6.8373652E&01	2.25460E-08	3.29747E-10
4	3.3682135E&01	3.3682123E&01	1.19637E-05	3.55195E-07
5	1.6741807E&01	1.6741883E&01	-7.62514E-05	-4.55455E-06
6	8.3590666E-00	8.3588975E-00	1.69104E-04	2.02300E-05
7	4.1826390E-00	4.1827647E-00	-1.25726E-04	-3.00591E-05

SUM OF WEIGHTED SQUARES OF THE RESIDUALS 5.03609E-08

CONSTANTS AND STANDARD ERRORS

N	1.993939003E-00	SN	3.64209E-05
B	5.416186364E-04	SB	1.29818E-06
C	-1.018633262E-07	SC	7.80735E-09
D	1.051585135E-10	SD	2.03704E-11
E	-6.999083838E-14	SE	1.62859E-14

VARIANCES AND COVARIANCES

S2N	1.32648E-09
S2B	1.68528E-12
S2C	6.09547E-17
S2D	4.14957E-22
S2E	2.65231E-28
S2BC	-1.00673E-14
S2BD	2.60790E-17
S2BE	-2.07644E-20
S2BN	-4.58664E-11
S2CD	-1.58831E-19
S2CE	1.26798E-22
S2CN	2.66601E-13
S2DE	-3.31662E-25
S2DN	-6.82769E-16
S2EN	5.40875E-19

TABLE 1. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES,
CONSTANTS, STANDARD ERRORS, VARIANCES,
AND COVARIANCES

RUN NO. HE-0-5

R	P, OBS., ATM.	P, CAL., ATM.	P, OBS. - P, CAL.	$\frac{P, OBS. - P, CAL.}{P, OBS.}$
0	6.9787955E+02	6.9787955E+02	0.00000E-99	0.00000E-99
1	3.0041472E+02	3.0041472E+02	-3.35343E-07	-1.11626E-09
2	1.4005441E+02	1.4005440E+02	9.70661E-06	6.93060E-08
3	6.7772168E+01	6.7772263E+01	-9.59061E-05	-1.41512E-06
4	3.3390191E+01	3.3389835E+01	3.56142E-04	1.06660E-05
5	1.6597313E+01	1.6597669E+01	-3.55743E-04	-2.14337E-05
6	8.2868246E-00	8.2873145E-00	-4.89857E-04	-5.91128E-05
7	4.1479419E-00	4.1471433E-00	7.98581E-04	1.92524E-04

SUM OF WEIGHTED SQUARES OF THE RESIDUALS 1.14037E-06

CONSTANTS AND STANDARD ERRORS

N	1.993843327E-00	SN	1.74902E-04
B	5.466948975E-04	SB	6.29277E-06
C	-1.328061192E-07	SC	3.82110E-08
D	1.849002861E-10	SD	1.00681E-10
E	-1.337548366E-13	SE	8.13379E-14

VARIANCES AND COVARIANCES

S2N	3.05910E-08
S2B	3.95990E-11
S2C	1.46008E-15
S2D	1.01366E-20
S2E	6.61586E-27
S2BC	-2.38838E-13
S2BD	6.24798E-16
S2BE	-5.02688E-19
S2BN	-1.06770E-09
S2CD	-3.84208E-18
S2CE	3.09940E-21
S2CN	6.26614E-12
S2DE	-8.18698E-24
S2DN	-1.62056E-14
S2EN	1.29722E-17

TABLE 1.- EXPERIMENTAL PRESSURES, CALCULATED PRESSURES,
CONSTANTS, STANDARD ERRORS, VARIANCES,
AND COVARIANCES

RUN NO. HE-0-6

R	P _y OBS., ATM.	P _y CAL., ATM.	P _y OBS.-P _y CAL.	$\frac{P_y \text{OBS.} - P_y \text{CAL.}}{P_y \text{OBS.}}$
0	7.0298868E&02	7.0298868E&02	0.000000E-99	0.000000E-99
1	3.0233845E&02	3.0233845E&02	-2.87909E-07	-9.52276E-10
2	1.4088835E&02	1.4088834E&02	8.38285E-06	5.94999E-08
3	6.8163698E&01	6.8163781E&01	-8.35556E-05	-1.22580E-06
4	3.3579834E&01	3.3579517E&01	3.17043E-04	9.44147E-06
5	1.6690781E&01	1.6691133E&01	-3.52147E-04	-2.10983E-05
6	8.3334615E-00	8.3337956E-00	-3.34104E-04	-4.00918E-05
7	4.1709998E-00	4.1703726E-00	6.27244E-04	1.50382E-04

SUM OF WEIGHTED SQUARES OF THE RESIDUALS 7.36637E-07

CONSTANTS AND STANDARD ERRORS

N	1.993826113E-00	SN	1.39744E-04
B	5.476766699E-04	SB	4.99846E-06
C	-1.438147947E-07	SC	3.01612E-08
D	2.218093849E-10	SD	7.89651E-11
E	-1.662886222E-13	SE	6.33621E-14

VARIANCES AND COVARIANCES

S2N	1.95286E-08
S2B	2.49846E-11
S2C	9.09703E-16
S2D	6.23549E-21
S2E	4.01475E-27
S2BC	-1.49747E-13
S2BD	3.89246E-16
S2BE	-3.11054E-19
S2BN	-6.77617E-10
S2CD	-2.37857E-18
S2CE	1.90580E-21
S2CN	3.95186E-12
S2DE	-5.00204E-24
S2DN	-1.01554E-14
S2EN	8.07430E-18

TABLE 1-- EXPERIMENTAL PRESSURES, CALCULATED PRESSURES,
CONSTANTS, STANDARD ERRORS, VARIANCES,
AND COVARIANCES

RUN NO. ME-0-8

R	PURST..ATM.	P.CAL..ATM.	P.OST..P.CAL.	P.OST..P.CAL.
0	1.03988485203	1.03988485203	0.000000-00	0.000000-00
1	3.0338485203	3.0338485203	-1.87099E-07	-1.87099E-07
2	1.40888485203	1.40888485203	8.8050E-08	8.8050E-08
3	0.81848885201	0.81848885201	-8.3822E-08	-1.5580E-08
4	3.38788485201	3.38788485201	3.1704E-08	9.4418E-08
5	1.66078485201	1.66078485201	-3.0514E-08	-5.1083E-08
6	8.338485200	8.338485200	-3.3410E-08	-4.0081E-08
7	4.170885200	4.170885200	8.3284E-08	1.2018E-08

SUM OF WEIGHTED SQUARES OF THE RESIDUALS 1.3883E-07

CONSTANTS AND STANDARD ERRORS

R	1.99382819E-00	24	1.3874E-04
B	2.4764E-04	28	4.9434E-08
C	-1.4381E-07	2C	3.0181E-08
D	5.51003E-10	2D	1.8881E-11
E	-1.60588255E-13	2E	8.1385E-16

VARIANCES AND COVARIANCES

25A	1.9258E-08
25B	5.484E-11
25C	8.0010E-10
25D	6.5849E-21
25E	4.0147E-23
25BC	-1.4874E-13
25BD	3.8824E-18
25BE	-3.1102E-19
25BN	-6.1701E-10
25CD	-5.3782E-18
25CE	1.8880E-21
25CN	3.4218E-15
25DE	-2.0020E-24
25DN	-1.0182E-14
25EN	8.0743E-18

TABLE 1. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES,
CONSTANTS, STANDARD ERRORS, VARIANCES,
AND COVARIANCES

RUN NO. HE-0-7

R	P _o OBS., ATM.	P _o CAL., ATM.	P _o OBS.-P _o CAL.	$\frac{P_o \text{OBS.} - P_o \text{CAL.}}{P_o \text{OBS.}}$
0	7.0208680E&02	7.0208680E&02	0.000000E-99	0.000000E-99
1	3.0200812E&02	3.0200812E&02	-8.49649E-08	-2.81333E-10
2	1.4074887E&02	1.4074887E&02	2.40998E-06	1.71225E-08
3	6.8097837E&01	6.8097860E&01	-2.26460E-05	-3.32551E-07
4	3.3548005E&01	3.3547932E&01	7.21276E-05	2.14998E-06
5	1.6674984E&01	1.6674992E&01	-8.01605E-06	-4.80723E-07
6	8.3248260E-00	8.3251101E-00	-2.84095E-04	-3.41262E-05
7	4.1658969E-00	4.1655831E-00	3.13808E-04	7.53280E-05

SUM OF WEIGHTED SQUARES OF THE RESIDUALS 1.84971E-07

CONSTANTS AND STANDARD ERRORS

N	1.994111211E-00	SN	7.01021E-05
B	5.386856559E-04	SB	2.50846E-06
C	-9.136795275E-08	SC	1.51548E-08
D	8.383231803E-11	SD	3.97213E-11
E	-5.507011298E-14	SE	3.19105E-14

VARIANCES AND COVARIANCES

S2N	4.91431E-09
S2B	6.29241E-12
S2C	2.29670E-16
S2D	1.57778E-21
S2E	1.01828E-27
S2BC	-3.77603E-14
S2BD	9.82619E-17
S2BE	-7.86161E-20
S2BN	-1.70587E-10
S2CD	-6.01185E-19
S2CE	4.82264E-22
S2CN	9.96078E-13
S2DE	-1.26718E-24
S2DN	-2.56257E-15
S2EN	2.03983E-18

TABLE 1. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES,
CONSTANTS, STANDARD ERRORS, VARIANCES,
AND COVARIANCES

RUN NO. HE-0-8

R	P, OBS., ATM.	P, CAL., ATM.	P, OBS. - P, CAL.	$\frac{P, OBS. - P, CAL.}{P, OBS.}$
0	7.0061130E&02	7.0061130E&02	0.000000E-99	0.000000E-99
1	3.0144846E&02	3.0144846E&02	-1.16412E-07	-3.86176E-10
2	1.4050824E&02	1.4050823E&02	3.37133E-06	2.39938E-08
3	6.7985497E&01	6.7985530E&01	-3.33121E-05	-4.89989E-07
4	3.3494053E&01	3.3493929E&01	1.23547E-04	3.68864E-06
5	1.6648795E&01	1.6648917E&01	-1.22430E-04	-7.35374E-06
6	8.3123743E-00	8.3125472E-00	-1.72841E-04	-2.07932E-05
7	4.1598289E-00	4.1595495E-00	2.79477E-04	6.71847E-05

SUM OF WEIGHTED SQUARES OF THE RESIDUALS 1.39355E-07

CONSTANTS AND STANDARD ERRORS

N	1.993975641E-00	SN	6.09450E-05
B	5.414390713E-04	SB	2.18501E-06
C	-1.030454877E-07	SC	1.32237E-08
D	1.079753721E-10	SD	3.47233E-11
E	-7.190779031E-14	SE	2.79499E-14

VARIANCES AND COVARIANCES

S2N	3.71429E-09
S2B	4.77429E-12
S2C	1.74868E-16
S2D	1.20571E-21
S2E	7.81198E-28
S2BC	-2.87001E-14
S2BD	7.48215E-17
S2BE	-5.99792E-20
S2BN	-1.29181E-10
S2CD	-4.58572E-19
S2CE	3.68581E-22
S2CN	7.55620E-13
S2DE	-9.70252E-25
S2DN	-1.94750E-15
S2EN	1.55325E-18

TABLE 1. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES,
CONSTANTS, STANDARD ERRORS, VARIANCES,
AND COVARIANCES

RUN NO. HE-0-9

R	P,OBS.,ATM.	P,CAL.,ATM.	P,OBS.-P,CAL.	$\frac{P,OBS.-P,CAL.}{P,OBS.}$
0	6.8457479E&02	6.8457479E&02	0.00000E-99	0.00000E-99
1	2.9540775E&02	2.9540775E&02	-8.58751E-07	-2.90700E-09
2	1.3787047E&02	1.3787044E&02	2.50057E-05	1.81371E-07
3	6.6752988E&01	6.6753241E&01	-2.52603E-04	-3.78415E-06
4	3.2896560E&01	3.2895561E&01	9.98397E-04	3.03496E-05
5	1.6350585E&01	1.6351910E&01	-1.32465E-03	-8.10157E-05
6	8.1629533E-00	8.1633795E-00	-4.26232E-04	-5.22155E-05
7	4.0856389E-00	4.0841794E-00	1.45952E-03	3.57232E-04

SUM OF WEIGHTED SQUARES OF THE RESIDUALS 5.12782E-06

CONSTANTS AND STANDARD ERRORS

N	1.994479452E-00	SN	3.76897E-04
B	5.324011839E-04	SB	1.37583E-05
C	-7.295609838E-08	SC	8.49822E-08
D	6.000621391E-11	SD	2.27756E-10
E	-4.564555850E-14	SE	1.87338E-13

VARIANCES AND COVARIANCES

S2N	1.42051E-07
S2B	1.89292E-10
S2C	7.22198E-15
S2D	5.18729E-20
S2E	3.50958E-26
S2BC	-1.16137E-12
S2BD	3.09020E-15
S2BE	-2.53135E-18
S2BN	-5.03032E-09
S2CD	-1.93298E-17
S2CE	1.58762E-20
S2CN	3.00310E-11
S2DE	-4.26559E-23
S2DN	-7.89966E-14
S2EN	6.43811E-17

TABLE 1. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES,
CONSTANTS, STANDARD ERRORS, VARIANCES,
AND COVARIANCES

RUN NO. HE-0-2

R	P.002-ATM.	P.CAL.,ATM.	P.002-P.CAL.	P.002-P.CAL.
0	0.000000-00	0.000000-00	0.000000-00	0.000000-00
1	0.000000-00	0.000000-00	0.000000-00	0.000000-00
2	0.000000-00	0.000000-00	0.000000-00	0.000000-00
3	0.000000-00	0.000000-00	0.000000-00	0.000000-00
4	0.000000-00	0.000000-00	0.000000-00	0.000000-00
5	0.000000-00	0.000000-00	0.000000-00	0.000000-00
6	0.000000-00	0.000000-00	0.000000-00	0.000000-00
7	0.000000-00	0.000000-00	0.000000-00	0.000000-00

SUM OF WEIGHTED SQUARES OF THE RESIDUALS 0.000000-00

CONSTANTS AND STANDARD ERRORS

A	1.000000-00	0.000000-00
B	0.000000-00	0.000000-00
C	0.000000-00	0.000000-00
D	0.000000-00	0.000000-00
E	0.000000-00	0.000000-00

VARIANCES AND COVARIANCES

25A	1.000000-00
25B	0.000000-00
25C	0.000000-00
25D	0.000000-00
25E	0.000000-00
25F	0.000000-00
25G	0.000000-00
25H	0.000000-00
25I	0.000000-00
25J	0.000000-00
25K	0.000000-00
25L	0.000000-00
25M	0.000000-00
25N	0.000000-00

TABLE 1.- EXPERIMENTAL PRESSURES, CALCULATED PRESSURES,
CONSTANTS, STANDARD ERRORS, VARIANCES,
AND COVARIANCES

RUN NO. HE-0-10

R	P,OBS.,ATM.	P,CAL.,ATM.	P,OBS.-P,CAL.	$\frac{P,OBS.-P,CAL.}{P,OBS.}$
0	7.0727559E&02	7.0727559E&02	0.00000E-99	0.00000E-99
1	3.0394992E&02	3.0394992E&02	-3.62977E-07	-1.19420E-09
2	1.4159267E&02	1.4159266E&02	1.08246E-05	7.64490E-08
3	6.8490921E&01	6.8491034E&01	-1.13602E-04	-1.65865E-06
4	3.3738977E&01	3.3738490E&01	4.87078E-04	1.44366E-05
5	1.6767501E&01	1.6768334E&01	-8.32724E-04	-4.96630E-05
6	8.3712273E-00	8.3708993E-00	3.28017E-04	3.91838E-05
7	4.1883028E-00	4.1880304E-00	2.72394E-04	6.50370E-05

SUM OF WEIGHTED SQUARES OF THE RESIDUALS 1.12549E-06

CONSTANTS AND STANDARD ERRORS

N	1.994369254E-00	SN	1.71925E-04
B	5.306463095E-04	SB	6.11227E-06
C	-4.457796685E-08	SC	3.66983E-08
D	-3.707047394E-11	SD	9.55722E-11
E	4.134430601E-14	SE	7.62549E-14

VARIANCES AND COVARIANCES

S2N	2.95582E-08
S2B	3.73598E-11
S2C	1.34677E-15
S2D	9.13405E-21
S2E	5.81482E-27
S2BC	-2.22804E-13
S2BD	5.76090E-16
S2BE	-4.57768E-19
S2BN	-1.01940E-09
S2CD	-3.50276E-18
S2CE	2.79071E-21
S2CN	5.91552E-12
S2DE	-7.28589E-24
S2DN	-1.51214E-14
S2EN	1.19548E-17

TABLE 1. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES,
CONSTANTS, STANDARD ERRORS, VARIANCES,
AND COVARIANCES

RUN NO. HE-D-10

R	P, OBS. - P, ATM.	P, CAL. - P, ATM.	P, OBS. - P, CAL.	P, OBS. - P, CAL.
0	1.0737228E-02	1.0737228E-02	0.00000E-00	0.00000E-00
1	3.0304435E-02	3.0304435E-02	-2.65977E-07	-1.14450E-00
2	1.4152472E-02	1.4152472E-02	1.08348E-02	1.64400E-00
3	6.6400216E-01	6.6410747E-01	-1.13002E-04	-1.83857E-00
4	3.3788477E-01	3.3784908E-01	4.87078E-04	1.44388E-02
5	1.6767207E-01	1.6768337E-01	-8.3258E-04	-4.88830E-03
6	8.311237E-00	8.310993E-00	3.28017E-04	3.41938E-02
7	4.188305E-00	4.188089E-00	5.15394E-04	4.23310E-02

SUM OF WEIGHTED SQUARES OF THE RESIDUALS 1.15249E-00

CONSTANTS AND STANDARD ERRORS

A	1.9843872E-00	24	1.71522E-04
B	2.3084830E-00	28	4.17375E-00
C	4.4237308E-00	20	3.68883E-00
D	3.1030473E-11	20	9.82352E-11
E	4.1344108E-10	28	1.62945E-10

VARIANCES AND COVARIANCES

25A	5.48282E-00
25B	2.73278E-11
25C	1.36473E-12
25D	9.13402E-21
25E	3.81482E-23
25B	-2.35804E-10
25C	2.74090E-12
25D	-4.83707E-19
25E	-1.01940E-07
25C	-3.50270E-18
25D	2.70071E-21
25E	2.91225E-22
25B	-1.30884E-20
25D	-1.81346E-14
25E	1.19848E-13

TABLE 1. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES,
CONSTANTS, STANDARD ERRORS, VARIANCES,
AND COVARIANCES

RUN NO. HE-0-11

R	P,OBS.,ATM.	P,CAL.,ATM.	P,OBS.-P,CAL.	$\frac{P,OBS.-P,CAL.}{P,OBS.}$
0	7.0340360E&02	7.0340360E&02	0.00000E-99	0.00000E-99
1	3.0249876E&02	3.0249876E&02	-1.31501E-07	-4.34717E-10
2	1.4096179E&02	1.4096179E&02	3.97368E-06	2.81898E-08
3	6.8196393E&01	6.8196436E&01	-4.29045E-05	-6.29132E-07
4	3.3595563E&01	3.3595367E&01	1.95716E-04	5.82565E-06
5	1.6697915E&01	1.6698304E&01	-3.89293E-04	-2.33139E-05
6	8.3369834E-00	8.3366936E-00	2.89817E-04	3.47628E-05
7	4.1713507E-00	4.1713713E-00	-2.05781E-05	-4.93321E-06

SUM OF WEIGHTED SQUARES OF THE RESIDUALS 2.76128E-07

CONSTANTS AND STANDARD ERRORS

N	1.994105241E-00	SN	8.55229E-05
B	5.391258960E-04	SB	3.05574E-06
C	-9.227134542E-08	SC	1.84312E-08
D	8.351823128E-11	SD	4.82297E-11
E	-5.369759023E-14	SE	3.86783E-14

VARIANCES AND COVARIANCES

S2N	7.31417E-09
S2B	9.33755E-12
S2C	3.39711E-16
S2D	2.32611E-21
S2E	1.49601E-27
S2BC	-5.59430E-14
S2BD	1.45339E-16
S2BE	-1.16079E-19
S2BN	-2.53516E-10
S2CD	-8.87773E-19
S2CE	7.10922E-22
S2CN	1.47790E-12
S2DE	-1.86494E-24
S2DN	-3.79592E-15
S2EN	3.01634E-18

TABLE 1.- EXPERIMENTAL PRESSURES, CALCULATED PRESSURES,
CONSTANTS, STANDARD ERRORS, VARIANCES,
AND COVARIANCES

RUN NO. HE-0-12

R	P, OBS., ATM.	P, CAL., ATM.	P, OBS. - P, CAL.	$\frac{P, OBS. - P, CAL.}{P, OBS.}$
0	6.9905324E&02	6.9905324E&02	0.000000E-99	0.000000E-99
1	3.0086678E&02	3.0086678E&02	-3.96015E-07	-1.31625E-09
2	1.4025209E&02	1.4025208E&02	1.16415E-05	8.30047E-08
3	6.7865373E&01	6.7865492E&01	-1.19042E-04	-1.75409E-06
4	3.3435772E&01	3.3435290E&01	4.82138E-04	1.44198E-05
5	1.6618379E&01	1.6619075E&01	-6.95124E-04	-4.18286E-05
6	8.2969111E-00	8.2969583E-00	-4.72621E-05	-5.69636E-06
7	4.1518777E-00	4.1513027E-00	5.75042E-04	1.38501E-04

SUM OF WEIGHTED SQUARES OF THE RESIDUALS 1.06287E-06

CONSTANTS AND STANDARD ERRORS

N	1.994245172E-00	SN	1.68653E-04
B	5.353153306E-04	SB	6.05466E-06
C	-7.414578749E-08	SC	3.67194E-08
D	4.200057926E-11	SD	9.66109E-11
E	-2.264392147E-14	SE	7.79278E-14

VARIANCES AND COVARIANCES

S2N	2.84440E-08
S2B	3.66589E-11
S2C	1.34831E-15
S2D	9.33366E-21
S2E	6.07274E-27
S2BC	-2.20831E-13
S2BD	5.76857E-16
S2BE	-4.63393E-19
S2BN	-9.90583E-10
S2CD	-3.54285E-18
S2CE	2.85355E-21
S2CN	5.80633E-12
S2DE	-7.52664E-24
S2DN	-1.49947E-14
S2EN	1.19843E-17

TABLE 1. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES,
CONSTANTS, STANDARD ERRORS, VARIANCES,
AND COVARIANCES

RUN NO. HE-0-13

R	P, OBS., ATM.	P, CAL., ATM.	P, OBS. - P, CAL.	$\frac{P, OBS. - P, CAL.}{P, OBS.}$
0	7.1102445E&02	7.1102445E&02	0.000000E-99	0.000000E-99
1	3.0535233E&02	3.0535233E&02	-4.50777E-08	-1.47625E-10
2	1.4213544E&02	1.4213544E&02	1.13644E-06	7.99554E-09
3	6.8777416E&01	6.8777423E&01	-7.06735E-06	-1.02756E-07
4	3.3877134E&01	3.3877150E&01	-1.58644E-05	-4.68293E-07
5	1.6837357E&01	1.6837116E&01	2.40652E-04	1.42927E-05
6	8.4059564E-00	8.4065833E-00	-6.26957E-04	-7.45848E-05
7	4.2075898E-00	4.2070920E-00	4.97763E-04	1.18301E-04

SUM OF WEIGHTED SQUARES OF THE RESIDUALS 6.99060E-07

CONSTANTS AND STANDARD ERRORS

N	1.993475623E-00	SN	1.34941E-04
B	5.712883742E-04	SB	4.78950E-06
C	-3.841960259E-07	SC	2.86339E-08
D	1.007309497E-09	SD	7.42556E-11
E	-8.541756459E-13	SE	5.89685E-14

VARIANCES AND COVARIANCES

S2N	1.82091E-08
S2B	2.29393E-11
S2C	8.19905E-16
S2D	5.51390E-21
S2E	3.47729E-27
S2BC	-1.36223E-13
S2BD	3.50748E-16
S2BE	-2.77407E-19
S2BN	-6.26994E-10
S2CD	-2.12347E-18
S2CE	1.68388E-21
S2CN	3.62315E-12
S2DE	-4.37758E-24
S2DN	-9.22329E-15
S2EN	7.25798E-18

TABLE 1. - EXPERIMENTAL PRESSURES, CALIBRATED PRESSURES,
CONSTANTS, STANDARD ERRORS, VARIANCES,
AND COVARIANCES

RUN NO. HE-0-13

R	P, OBS., ATM.	P, CAL., ATM.	P, OBS., P, CAL.	P, OBS., P, CAL.
0	1.102442802	1.102442802	0.00000E-00	0.00000E-00
1	3.033333302	3.033333302	-4.20777E-08	-1.41822E-10
2	1.4519244602	1.4519244602	1.13244E-06	1.22244E-09
3	6.8777777601	6.8777777601	-7.06732E-06	-3.02722E-07
4	3.3877777601	3.3877777601	-1.22244E-06	-4.08732E-07
5	1.8837373601	1.8837373601	2.40222E-04	1.43222E-02
6	8.4022244E-00	8.4022244E-00	-6.12222E-04	-1.42222E-02
7	4.2022244E-00	4.2022244E-00	4.22222E-04	1.12222E-04

SUM OF WEIGHTED SQUARES OF THE RESIDUALS 0.22000E-07

CONSTANTS AND STANDARD ERRORS

N	1.003472832E-00	24	1.34242E-04
B	2.912883742E-04	25	4.78222E-06
C	3.841882222E-07	26	2.82222E-08
D	1.03302447E-09	27	7.42222E-11
E	8.241222222E-13	28	2.82222E-14

VARIANCES AND COVARIANCES

25N	1.92041E-08
25B	2.22222E-11
25C	8.12222E-16
25D	2.21222E-21
25E	1.47222E-21
25BC	-1.22222E-13
25BD	3.20777E-16
25BE	-5.12222E-19
25BN	-4.22222E-10
25CD	-2.12222E-18
25CE	1.42222E-21
25CN	3.42222E-15
25DE	-4.22222E-24
25DN	-4.22222E-12
25EN	2.22222E-18

TABLE 1. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES,
CONSTANTS, STANDARD ERRORS, VARIANCES,
AND COVARIANCES

RUN NO. HE-0-14

R	P, OBS., ATM.	P, CAL., ATM.	P, OBS. - P, CAL.	$\frac{P, OBS. - P, CAL.}{P, OBS.}$
0	6.9853895E&02	6.9853895E&02	0.000000E-99	0.000000E-99
1	3.0067567E&02	3.0067567E&02	-1.36261E-07	-4.53184E-10
2	1.4016953E&02	1.4016952E&02	3.92042E-06	2.79691E-08
3	6.7826865E&01	6.7826903E&01	-3.81937E-05	-5.63105E-07
4	3.3416347E&01	3.3416210E&01	1.36296E-04	4.07874E-06
5	1.6609979E&01	1.6610086E&01	-1.06574E-04	-6.41629E-06
6	8.2927140E-00	8.2929869E-00	-2.72849E-04	-3.29023E-05
7	4.1500376E-00	4.1496618E-00	3.75860E-04	9.05680E-05

SUM OF WEIGHTED SQUARES OF THE RESIDUALS 2.47127E-07

CONSTANTS AND STANDARD ERRORS

N	1.994028680E-00	SN	8.13604E-05
B	5.421915609E-04	SB	2.92387E-06
C	-1.125174866E-07	SC	1.77411E-08
D	1.386584195E-10	SD	4.67065E-11
E	-9.903232008E-14	SE	3.76995E-14

VARIANCES AND COVARIANCES

S2N	6.61951E-09
S2B	8.54907E-12
S2C	3.14749E-16
S2D	2.18150E-21
S2E	1.42125E-27
S2BC	-5.15248E-14
S2BD	1.34675E-16
S2BE	-1.08258E-19
S2BN	-2.30770E-10
S2CD	-8.27545E-19
S2CE	6.66984E-22
S2CN	1.35334E-12
S2DE	-1.76034E-24
S2DN	-3.49711E-15
S2EN	2.79687E-18

TABLE 1. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES,
CONSTANTS, STANDARD ERRORS, VARIANCES,
AND COVARIANCES

RUN NO. HE-0-15

R	P, OBS., ATM.	P, CAL., ATM.	P, OBS. - P, CAL.	$\frac{P, OBS. - P, CAL.}{P, OBS.}$
0	7.0725396E&02	7.0725396E&02	0.000000E-99	0.000000E-99
1	3.0393974E&02	3.0393974E&02	-2.74284E-07	-9.02429E-10
2	1.4158487E&02	1.4158486E&02	8.05537E-06	5.68943E-08
3	6.8487098E&01	6.8487180E&01	-8.17057E-05	-1.19300E-06
4	3.3735978E&01	3.3735654E&01	3.23494E-04	9.58901E-06
5	1.6766788E&01	1.6767217E&01	-4.29003E-04	-2.55865E-05
6	8.3707330E-00	8.3708732E-00	-1.40204E-04	-1.67494E-05
7	4.1888843E-00	4.1884090E-00	4.75284E-04	1.13463E-04

SUM OF WEIGHTED SQUARES OF THE RESIDUALS 5.40986E-07

CONSTANTS AND STANDARD ERRORS

N	1.994111665E-00	SN	1.19192E-04
B	5.399432125E-04	SB	4.24016E-06
C	-9.881698364E-08	SC	2.54554E-08
D	1.033296948E-10	SD	6.62935E-11
E	-7.054209784E-14	SE	5.28955E-14

VARIANCES AND COVARIANCES

S2N	1.42067E-08
S2B	1.79789E-11
S2C	6.47980E-16
S2D	4.39483E-21
S2E	2.79793E-27
S2BC	-1.07210E-13
S2BD	2.77209E-16
S2BE	-2.20280E-19
S2BN	-4.90272E-10
S2CD	-1.68532E-18
S2CE	1.34276E-21
S2CN	2.84471E-12
S2DE	-3.50568E-24
S2DN	-7.27187E-15
S2EN	5.74922E-18

TABLE 1. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES,
CONSTANTS, STANDARD ERRORS, VARIANCES,
AND COVARIANCES

RUN NO. HE-0-16

R	P,OBS.,ATM.	P,CAL.,ATM.	P,OBS.-P,CAL.	$\frac{P,OBS.-P,CAL.}{P,OBS.}$
0	7.0575241E&02	7.0575241E&02	0.00000E-99	0.00000E-99
1	3.0337578E&02	3.0337578E&02	-3.36101E-08	-1.10787E-10
2	1.4134198E&02	1.4134198E&02	9.83975E-07	6.96166E-09
3	6.8374213E&01	6.8374223E&01	-9.92651E-06	-1.45179E-07
4	3.3681291E&01	3.3681253E&01	3.87833E-05	1.15147E-06
5	1.6740047E&01	1.6740096E&01	-4.88564E-05	-2.91853E-06
6	8.3570058E-00	8.3570300E-00	-2.42360E-05	-2.90008E-06
7	4.1813150E-00	4.1812520E-00	6.30882E-05	1.50881E-05

SUM OF WEIGHTED SQUARES OF THE RESIDUALS 8.55811E-09

CONSTANTS AND STANDARD ERRORS

N	1.994264314E-00	SN	1.50174E-05
B	5.353400680E-04	SB	5.34983E-07
C	-7.458610629E-08	SC	3.21792E-09
D	4.320304227E-11	SD	8.39617E-12
E	-2.345699852E-14	SE	6.71260E-15

VARIANCES AND COVARIANCES

S2N	2.25523E-10
S2B	2.86207E-13
S2C	1.03550E-17
S2D	7.04957E-23
S2E	4.50591E-29
S2BC	-1.70997E-15
S2BD	4.42972E-18
S2BE	-3.52699E-21
S2BN	-7.79364E-12
S2CD	-2.69829E-20
S2CE	2.15410E-23
S2CN	4.53083E-14
S2DE	-5.63450E-26
S2DN	-1.16037E-16
S2EN	9.19226E-20

TABLE 1.- EXPERIMENTAL PRESSURES, CALCULATED PRESSURES,
CONSTANTS, STANDARD ERRORS, VARIANCES,
AND COVARIANCES

RUN NO. HE-0-17

R	P, OBS., ATM.	P, CAL., ATM.	P, OBS.-P, CAL.	$\frac{P, OBS.-P, CAL.}{P, OBS.}$
0	6.9911233E&02	6.9911233E&02	0.000000E-99	0.000000E-99
1	3.0088594E&02	3.0088594E&02	-3.12601E-08	-1.03893E-10
2	1.4025861E&02	1.4025861E&02	9.60118E-07	6.84534E-09
3	6.7867489E&01	6.7867500E&01	-1.07305E-05	-1.58110E-07
4	3.3436121E&01	3.3436069E&01	5.23578E-05	1.56590E-06
5	1.6619056E&01	1.6619175E&01	-1.19015E-04	-7.16140E-06
6	8.2968869E-00	8.2967664E-00	1.20487E-04	1.45220E-05
7	4.1510115E-00	4.1510524E-00	-4.08375E-05	-9.83797E-06

SUM OF WEIGHTED SQUARES OF THE RESIDUALS 3.32070E-08

CONSTANTS AND STANDARD ERRORS

N	1.994338356E-00	SN	2.98089E-05
B	5.328001207E-04	SB	1.06990E-06
C	-5.888051837E-08	SC	6.48856E-09
D	1.927164214E-12	SD	1.70709E-11
E	9.605308287E-15	SE	1.37687E-14

VARIANCES AND COVARIANCES

S2N	8.88574E-10
S2B	1.14470E-12
S2C	4.21014E-17
S2D	2.91416E-22
S2E	1.89578E-28
S2BC	-6.89557E-15
S2BD	1.80117E-17
S2BE	-1.44680E-20
S2BN	-3.09383E-11
S2CD	-1.10620E-19
S2CE	8.90923E-23
S2CN	1.81343E-13
S2DE	-2.34981E-25
S2DN	-4.68293E-16
S2EN	3.74249E-19

TABLE 1.- EXPERIMENTAL PRESSURES, CALCULATED PRESSURES,
CONSTANTS, STANDARD ERRORS, VARIANCES,
AND COVARIANCES

RUN NO. HE-0-18

R	P, OBS., ATM.	P, CAL., ATM.	P, OBS.-P, CAL.	$\frac{P, OBS.-P, CAL.}{P, OBS.}$
0	7.0498797E&02	7.0498797E&02	0.000000E-99	0.000000E-99
1	3.0309166E&02	3.0309166E&02	3.06488E-07	1.01120E-09
2	1.4121823E&02	1.4121824E&02	-8.82385E-06	-6.24838E-08
3	6.8316532E&01	6.8316446E&01	8.57940E-05	1.25583E-06
4	3.3653188E&01	3.3653491E&01	-3.03230E-04	-9.01046E-06
5	1.6726144E&01	1.6725925E&01	2.19723E-04	1.31365E-05
6	8.3501239E-00	8.3494660E-00	6.57895E-04	7.87886E-05
7	4.1762502E-00	4.1771287E-00	-8.78514E-04	-2.10359E-04

SUM OF WEIGHTED SQUARES OF THE RESIDUALS 1.35227E-06

CONSTANTS AND STANDARD ERRORS

N	1.994478108E-00	SN	1.88943E-04
B	5.290711137E-04	SB	6.73397E-06
C	-4.095801817E-08	SC	4.05479E-08
D	-3.981793554E-11	SD	1.05900E-10
E	4.117611761E-14	SE	8.47521E-14

VARIANCES AND COVARIANCES

S2N	3.56995E-08
S2B	4.53464E-11
S2C	1.64413E-15
S2D	1.12149E-20
S2E	7.18291E-27
S2BC	-2.71215E-13
S2BD	7.03274E-16
S2BE	-5.60525E-19
S2BN	-1.23424E-09
S2CD	-4.28843E-18
S2CE	3.42703E-21
S2CN	7.18292E-12
S2DE	-8.97287E-24
S2DN	-1.84138E-14
S2EN	1.46018E-17

TABLE 1 - EXPERIMENTAL RESULTS, CALCULATED PRESSURES,
CONSTANTS, STANDARD ERRORS, VARIANCES,
AND COVARIANCES

RUN NO. WF-0-15

K	P, 0.02, 1.01M.	P, 0.01, 1.01M.	P, 0.02, 1.01M.	P, 0.02, 1.01M.
0	7.048707E-03	7.048707E-03	0.00000E-00	0.00000E-00
1	3.090466E-03	3.090466E-03	3.090466E-03	1.01150E-02
2	1.412182E-03	1.412182E-03	-8.34828E-08	-8.34828E-08
3	6.931633E-01	6.931633E-01	2.3740E-07	1.5288E-08
4	3.362818E-01	3.362818E-01	-3.0371E-04	-9.0104E-08
5	1.675044E-01	1.675044E-01	1.1973E-04	1.3188E-08
6	8.350123E-00	8.350123E-00	6.2702E-04	1.8786E-08
7	4.124202E-00	4.171287E-00	-8.7821E-04	-5.1022E-04

SUM OF WEIGHTED SQUARES OF THE RESIDUALS 1.3527E-08

CONSTANTS AND STANDARD ERRORS

A	1.9947810E-00	24	1.9947810E-04
B	2.3967117E-04	20	6.7397E-05
C	4.6306107E-08	21	4.630610E-08
D	3.6670235E-11	20	1.0240E-10
E	4.1151110E-14	22	8.4735E-14

VARIANCES AND COVARIANCES

25M	3.5699E-08
25B	4.300E-11
25C	1.6613E-12
25D	1.1514E-20
25E	3.1826E-24
25B	-5.9131E-13
25B	7.0371E-16
25B	-2.9023E-19
25M	-1.3245E-09
25D	-4.7886E-18
25E	8.4570E-21
25M	7.1850E-11
25B	-8.9128E-24
25D	-1.8473E-14
25M	1.66018E-11

TABLE 1. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES,
CONSTANTS, STANDARD ERRORS, VARIANCES,
AND COVARIANCES

RUN NO. HE-0-19

R	P,OBS.,ATM.	P,CAL.,ATM.	P,OBS.-P,CAL.	$\frac{P,OBS.-P,CAL.}{P,OBS.}$
0	6.9586241E&02	6.9586241E&02	0.00000E-99	0.00000E-99
1	2.9965869E&02	2.9965869E&02	-2.60724E-07	-8.70072E-10
2	1.3972241E&02	1.3972240E&02	7.58376E-06	5.42773E-08
3	6.7615486E&01	6.7615562E&01	-7.59574E-05	-1.12337E-06
4	3.3314160E&01	3.3313868E&01	2.92386E-04	8.77663E-06
5	1.6558741E&01	1.6559088E&01	-3.47223E-04	-2.09691E-05
6	8.2667975E-00	8.2670405E-00	-2.43001E-04	-2.93949E-05
7	4.1368299E-00	4.1363050E-00	5.24890E-04	1.26882E-04

SUM OF WEIGHTED SQUARES OF THE RESIDUALS 5.46440E-07

CONSTANTS AND STANDARD ERRORS

N	1.994282015E-00	SN	1.21383E-04
B	5.342936958E-04	SB	4.37380E-06
C	-6.373980437E-08	SC	2.66319E-08
D	1.024550546E-11	SD	7.03542E-11
E	4.496844820E-15	SE	5.69923E-14

VARIANCES AND COVARIANCES

S2N	1.47340E-08
S2B	1.91301E-11
S2C	7.09259E-16
S2D	4.94971E-21
S2E	3.24812E-27
S2BC	-1.15700E-13
S2BD	3.03459E-16
S2BE	-2.44816E-19
S2BN	-5.15020E-10
S2CD	-1.87121E-18
S2CE	1.51361E-21
S2CN	3.03090E-12
S2DE	-4.00856E-24
S2DN	-7.85892E-15
S2EN	6.30801E-18

TABLE I - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES,
CONSTANT, STANDARD ERROR, VARIANCE,
AND COVARIANCE

RUN NO. 44-0-12

R	P,082,47M.	P,CAL.,ATM.	P,082,47CAL.	P,082,47CAL.
0	6.926241E03	6.926241E03	6.926241E03	6.926241E03
1	3.998888E03	3.998888E03	3.998888E03	3.998888E03
2	1.397224E03	1.397224E03	1.397224E03	1.397224E03
3	6.761248E01	6.761248E01	6.761248E01	6.761248E01
4	3.381416E01	3.381416E01	3.381416E01	3.381416E01
5	1.622874E01	1.622874E01	1.622874E01	1.622874E01
6	8.266747E-00	8.266747E-00	8.266747E-00	8.266747E-00
7	4.136822E-00	4.136822E-00	4.136822E-00	4.136822E-00

SUM OF WEIGHTED SQUARES OF THE RESIDUALS 3.4440E-01

CONSTANTS AND STANDARD ERRORS

B	1.99423012E-00	24	1.5183E-04
B	2.34239998E-04	25	4.1780E-04
C	6.3739097E-08	26	3.6633E-08
D	1.0242094E-11	27	1.0342E-11
E	4.46846820E-12	28	2.8023E-12

VARIANCES AND COVARIANCES

25B	1.47940E-08
25B	1.61301E-11
25C	1.00529E-19
25D	4.44971E-21
25E	3.34815E-23
25B	-1.12700E-13
25B	3.03620E-18
25B	-2.44816E-19
25B	-2.12020E-10
25C	-1.81121E-18
25C	1.21381E-21
25D	3.03090E-13
25D	-4.0888E-24
25D	-1.82843E-12
25E	6.30801E-26

TABLE 1. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES,
CONSTANTS, STANDARD ERRORS, VARIANCES,
AND COVARIANCES

RUN NO. HE-0-20

R	P, OBS., ATM.	P, CAL., ATM.	P, OBS. - P, CAL.	$\frac{P, OBS. - P, CAL.}{P, OBS.}$
0	6.8620552E&02	6.8620552E&02	0.00000E-99	0.00000E-99
1	2.9602082E&02	2.9602082E&02	-1.64995E-07	-5.57379E-10
2	1.3813812E&02	1.3813811E&02	4.88728E-06	3.53797E-08
3	6.6875363E&01	6.6875414E&01	-5.11980E-05	-7.65573E-07
4	3.2955262E&01	3.2955042E&01	2.20202E-04	6.68184E-06
5	1.6381782E&01	1.6382164E&01	-3.81277E-04	-2.32744E-05
6	8.1792899E-00	8.1791268E-00	1.63050E-04	1.99346E-05
7	4.0925711E-00	4.0924605E-00	1.10571E-04	2.70176E-05

SUM OF WEIGHTED SQUARES OF THE RESIDUALS 2.35318E-07

CONSTANTS AND STANDARD ERRORS

N	1.994241405E-00	SN	8.05600E-05
B	5.367061562E-04	SB	2.93629E-06
C	-8.174782408E-08	SC	1.80964E-08
D	6.166310965E-11	SD	4.83961E-11
E	-3.874496394E-14	SE	3.97189E-14

VARIANCES AND COVARIANCES

S2N	6.48991E-09
S2B	8.62181E-12
S2C	3.27482E-16
S2D	2.34218E-21
S2E	1.57759E-27
S2BC	-5.27799E-14
S2BD	1.40138E-16
S2BE	-1.14538E-19
S2BN	-2.29468E-10
S2CD	-8.74650E-19
S2CE	7.16777E-22
S2CN	1.36685E-12
S2DE	-1.92172E-24
S2DN	-3.58785E-15
S2EN	2.91751E-18

TABLE 1. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES,
CONSTANTS, STANDARD ERRORS, VARIANCES,
AND COVARIANCES

NO. MC. MC-0-50

R	P, OBS., ATM.	P, CAL., ATM.	P, OBS., P-CAL.	P, OBS., P-CAL.
0	4.880252E05	4.880252E05	0.00000E-00	0.00000E-00
1	3.980252E05	3.980252E05	1.00000E-01	1.00000E-01
2	1.380252E05	1.380252E05	4.00000E-01	4.00000E-01
3	0.000252E05	0.000252E05	0.00000E-01	0.00000E-01
4	3.500252E05	3.500252E05	1.00000E-01	1.00000E-01
5	1.000252E05	1.000252E05	0.00000E-01	0.00000E-01
6	0.000252E05	0.000252E05	0.00000E-01	0.00000E-01
7	4.000252E05	4.000252E05	1.00000E-01	1.00000E-01

SUM OF WEIGHTED SQUARES OF THE RESIDUALS 1.33318E-01

CONSTANTS AND STANDARD ERRORS

W	1.304252E-05	20	8.00000E-02
E	0.000252E-05	20	1.00000E-01
C	0.000252E-05	20	1.00000E-01
D	0.000252E-11	20	4.00000E-11
F	0.000252E-14	20	0.00000E-14

VARIANCES AND COVARIANCES

W	0.00000E-05
E	0.00000E-11
C	0.00000E-14
D	0.00000E-28
F	0.00000E-42
W	0.00000E-05
E	0.00000E-11
C	0.00000E-14
D	0.00000E-28
F	0.00000E-42
W	0.00000E-05
E	0.00000E-11
C	0.00000E-14
D	0.00000E-28
F	0.00000E-42

TABLE 1. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES,
CONSTANTS, STANDARD ERRORS, VARIANCES,
AND COVARIANCES

RUN NO. HE-0-21

R	P,OBS.,ATM.	P,CAL.,ATM.	P,OBS.-P,CAL.	$\frac{P,OBS.-P,CAL.}{P,OBS.}$
0	7.7435393E&02	7.7435393E&02	0.000000E-99	0.000000E-99
1	3.2882507E&02	3.2882507E&02	-9.27759E-08	-2.82143E-10
2	1.5234062E&02	1.5234062E&02	2.81757E-06	1.84952E-08
3	7.3499612E&01	7.3499642E&01	-2.94016E-05	-4.00024E-07
4	3.6158408E&01	3.6158286E&01	1.21804E-04	3.36863E-06
5	1.7959522E&01	1.7959708E&01	-1.85601E-04	-1.03344E-05
6	8.9632908E-00	8.9632758E-00	1.50666E-05	1.68093E-06
7	4.4841902E-00	4.4840663E-00	1.23958E-04	2.76434E-05

SUM OF WEIGHTED SQUARES OF THE RESIDUALS 6.57494E-08

CONSTANTS AND STANDARD ERRORS

N	1.994127380E-00	SN	3.86445E-05
B	5.405870081E-04	SB	1.27823E-06
C	-1.057331219E-07	SC	7.09840E-09
D	1.200427622E-10	SD	1.70805E-11
E	-7.964605826E-14	SE	1.25267E-14

VARIANCES AND COVARIANCES

S2N	1.49339E-09
S2B	1.63389E-12
S2C	5.03873E-17
S2D	2.91744E-22
S2E	1.56919E-28
S2BC	-9.01247E-15
S2BD	2.15325E-17
S2BE	-1.57285E-20
S2BN	-4.79193E-11
S2CD	-1.21088E-19
S2CE	8.86802E-23
S2CN	2.57189E-13
S2DE	-2.13907E-25
S2DN	-6.07552E-16
S2EN	4.41578E-19

TABLE 1. - EXPERIMENTAL PRESSURES, CALCULATED PRESSURES,
CONSTANTS, STANDARD ERRORS, VARIANCES,
AND COVARIANCES

RUN NO. HE-0-22

R	P,OBS.,ATM.	P,CAL.,ATM.	P,OBS.-P,CAL.	$\frac{P,OBS.-P,CAL.}{P,OBS.}$
0	5.8218590E&02	5.8218590E&02	0.000000E-99	0.000000E-99
1	2.5608357E&02	2.5608357E&02	-1.09367E-07	-4.27075E-10
2	1.2058177E&02	1.2058177E&02	3.10785E-06	2.57738E-08
3	5.8627782E&01	5.8627814E&01	-3.19765E-05	-5.45415E-07
4	2.8951908E&01	2.8951771E&01	1.36874E-04	4.72764E-06
5	1.4406838E&01	1.4407077E&01	-2.39130E-04	-1.65983E-05
6	7.1967975E-00	7.1966872E-00	1.10275E-04	1.53228E-05
7	3.6018337E-00	3.6017737E-00	6.00342E-05	1.66676E-05

SUM OF WEIGHTED SQUARES OF THE RESIDUALS 9.27149E-08

CONSTANTS AND STANDARD ERRORS

N	1.994282192E-00	SN	5.78728E-05
B	5.353764840E-04	SB	2.41484E-06
C	-7.534299421E-08	SC	1.71843E-08
D	4.750268666E-11	SD	5.31576E-11
E	-2.987853666E-14	SE	5.08851E-14

VARIANCES AND COVARIANCES

S2N	3.34926E-09
S2B	5.83146E-12
S2C	2.95301E-16
S2D	2.82574E-21
S2E	2.58929E-27
S2BC	-4.12194E-14
S2BD	1.26577E-16
S2BE	-1.20650E-19
S2BN	-1.35569E-10
S2CD	-9.12246E-19
S2CE	8.71908E-22
S2CN	9.32449E-13
S2DE	-2.70415E-24
S2DN	-2.83028E-15
S2EN	2.68366E-18

number to the right of the E indicates the exponent of ten for the number to the left of the E.

A weighting factor of 1 was used for the calculations and the sum of the weighted squares of the residuals is printed out in table 1 for each of the twenty-two runs.

The least squares calculated constants for equation (3) (N, B, C, D, and E), and the standard errors of the constants (SN, SB, SC, SD, and SE) are listed in table 1 for each of the twenty-two runs.

The variances of the constants were designated as S2N, S2B, S2C, S2D, and S2E. Covariances of the constants were designated as S2BC, S2BD, S2BE, S2BN, S2CD, S2CE, S2CN, S2DE, S2DN, and S2EN. Variances and covariances of the constants are recorded in table 1.

Variances of pressures calculated at nominal increments of pressure and covariances of BP, CP, DP, and EP at nominal increments of pressure are recorded in table 2 under the headings S2P, S2BP, S2CP, S2DP, and S2EP, respectively.

Compressibility factors and standard errors of the compressibility factors calculated at nominal increments of pressure are listed in table 3 under the headings Z and SZ, respectively.

Values of the compressibility apparatus zero-pressure volume ratio (N) for each of the twenty-two runs are recorded in table 4 along with the value of the average N, the standard error of the average N, the average standard error of N, and the standard error of a single N.

Values for the constant B of equation (3) for helium at 0° C are recorded in table 5 for each of the twenty-two compressibility

TABLE 2.- VARIANCES AND COVARIANCES AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-1

PRESSURE, ATM.	S2P	S2BP	S2CP
1.000E-00	4.52698E-08	1.02654E-09	-6.31376E-12
2.000E-00	8.94544E-08	1.39839E-09	-8.53465E-12
5.000E-00	1.42525E-07	1.55067E-09	-9.21453E-12
1.000E&01	1.22381E-07	8.09880E-10	-4.27563E-12
2.500E&01	2.00165E-07	-1.54862E-09	1.04756E-11
5.000E&01	2.03209E-07	-8.45092E-10	4.49085E-12
7.500E&01	5.58713E-07	2.53091E-09	-1.81193E-11
1.000E&02	9.03229E-07	4.10653E-09	-2.79467E-11
1.250E&02	3.22662E-07	1.39455E-09	-8.94864E-12
1.500E&02	2.01177E-06	-5.86187E-09	4.01804E-11
2.000E&02	2.77156E-05	-2.57210E-08	1.72853E-10
2.500E&02	2.80516E-05	-2.64102E-08	1.76461E-10
3.000E&02	3.68093E-05	3.03747E-08	-2.02389E-10
3.500E&02	1.21258E-03	1.76448E-07	-1.17316E-09
4.000E&02	6.85558E-03	4.21201E-07	-2.79648E-09
4.500E&02	2.08053E-02	7.35671E-07	-4.87917E-09
5.000E&02	4.11726E-02	1.03687E-06	-6.87121E-09
6.000E&02	3.15345E-02	9.09813E-07	-6.02203E-09
7.000E&02	1.86655E-01	-2.21732E-06	1.46643E-08
8.000E&02	5.55929E-00	-1.21158E-05	8.00798E-08
9.000E&02	4.33707E&01	-3.38719E-05	2.23773E-07
1.000E&03	2.01641E&02	-7.30872E-05	4.82671E-07

PRESSURE, ATM.	S2DP	S2EP
1.000E-00	1.73115E-14	-1.48135E-17
2.000E-00	2.33254E-14	-1.99309E-17
5.000E-00	2.48996E-14	-2.11677E-17
1.000E&01	1.09353E-14	-9.05923E-18
2.500E&01	-2.96983E-14	2.57695E-17
5.000E&01	-1.12146E-14	9.13540E-18
7.500E&01	5.29281E-14	-4.65754E-17
1.000E&02	7.98285E-14	-6.95431E-17
1.250E&02	2.46480E-14	-2.10743E-17
1.500E&02	-1.15800E-13	1.01395E-16
2.000E&02	-4.92691E-13	4.29077E-16
2.500E&02	-5.01468E-13	4.36089E-16
3.000E&02	5.74590E-13	-4.99503E-16
3.500E&02	3.32669E-12	-2.89021E-15
4.000E&02	7.92430E-12	-6.88230E-15
4.500E&02	1.38189E-11	-1.19990E-14
5.000E&02	1.94533E-11	-1.68882E-14
6.000E&02	1.70397E-11	-1.47891E-14
7.000E&02	-4.14778E-11	3.59930E-14
8.000E&02	-2.26440E-10	1.96472E-13
9.000E&02	-6.32627E-10	5.48846E-13
1.000E&03	-1.36432E-09	1.18354E-12

TABLE 2.- VARIANCES AND COVARIANCES AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-2

PRESSURE, ATM.	S2P	S2BP	S2CP
1.000E-00	2.00253E-08	4.21861E-10	-2.45406E-12
2.000E-00	4.01724E-08	5.80027E-10	-3.34938E-12
5.000E-00	6.63585E-08	6.62061E-10	-3.72947E-12
1.000E&01	5.87205E-08	3.82005E-10	-1.95206E-12
2.500E&01	8.85471E-08	-6.04126E-10	3.90565E-12
5.000E&01	9.76069E-08	-4.75875E-10	2.57255E-12
7.500E&01	2.18616E-07	8.67039E-10	-5.98369E-12
1.000E&02	4.36500E-07	1.73943E-09	-1.12627E-11
1.250E&02	2.22555E-07	1.08894E-09	-6.81909E-12
1.500E&02	4.21171E-07	-1.36468E-09	8.96154E-12
2.000E&02	9.96091E-06	-9.43209E-09	6.00344E-11
2.500E&02	1.82525E-05	-1.31132E-08	8.29228E-11
3.000E&02	3.36483E-07	1.31335E-09	-8.29125E-12
3.500E&02	2.26310E-04	4.69370E-08	-2.95218E-10
4.000E&02	1.74980E-03	1.31123E-07	-8.23449E-10
4.500E&02	6.34438E-03	2.50395E-07	-1.57069E-09
5.000E&02	1.49647E-02	3.85357E-07	-2.41519E-09
6.000E&02	2.67012E-02	5.16200E-07	-3.23116E-09
7.000E&02	1.48877E-03	-1.22115E-07	7.63716E-10
8.000E&02	7.04251E-01	-2.65943E-06	1.66215E-08
9.000E&02	7.46737E-00	-8.66827E-06	5.41506E-08
1.000E&03	3.94200E&01	-1.99313E-05	1.24462E-07

PRESSURE, ATM.	S2DP	S2EP
1.000E-00	6.35925E-15	-5.12479E-18
2.000E-00	8.65278E-15	-6.96361E-18
5.000E-00	9.53462E-15	-7.63753E-18
1.000E&01	4.77474E-15	-3.74719E-18
2.500E&01	-1.05025E-14	8.59523E-18
5.000E&01	-6.35222E-15	4.99301E-18
7.500E&01	1.66417E-14	-1.38338E-17
1.000E&02	3.04854E-14	-2.50400E-17
1.250E&02	1.81237E-14	-1.47543E-17
1.500E&02	-2.45898E-14	2.03486E-17
2.000E&02	-1.61808E-13	1.32734E-16
2.500E&02	-2.22751E-13	1.82434E-16
3.000E&02	2.22971E-14	-1.82808E-17
3.500E&02	7.91112E-13	-6.47227E-16
4.000E&02	2.20495E-12	-1.80326E-15
4.500E&02	4.20357E-12	-3.43691E-15
5.000E&02	6.46099E-12	-5.28160E-15
6.000E&02	8.63874E-12	-7.05990E-15
7.000E&02	-2.04102E-12	1.66769E-15
8.000E&02	-4.44080E-11	3.62802E-14
9.000E&02	-1.44642E-10	1.18156E-13
1.000E&03	-3.32394E-10	2.71507E-13

TABLE 2. - VARIANCES AND COVARIANCES AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-3

PRESSURE, ATM.	S2P	S2BP	S2CP
1.000E-00	7.05656E-08	1.46061E-09	-8.38259E-12
2.000E-00	1.42063E-07	2.01260E-09	-1.14666E-11
5.000E-00	2.36659E-07	2.31262E-09	-1.28588E-11
1.000E&01	2.11018E-07	1.36352E-09	-6.90605E-12
2.500E&01	3.11841E-07	-2.06126E-09	1.31830E-11
5.000E&01	3.51843E-07	-1.74880E-09	9.43230E-12
7.500E&01	7.46539E-07	2.84942E-09	-1.95133E-11
1.000E&02	1.55697E-06	6.02887E-09	-3.85690E-11
1.250E&02	8.71732E-07	4.13763E-09	-2.56511E-11
1.500E&02	1.22418E-06	-3.91451E-09	2.55058E-11
2.000E&02	3.29779E-05	-3.15646E-08	1.98282E-10
2.500E&02	6.77505E-05	-4.65443E-08	2.90423E-10
3.000E&02	7.90040E-07	-3.07831E-09	1.90989E-11
3.500E&02	6.24973E-04	1.43728E-07	-8.91909E-10
4.000E&02	5.31744E-03	4.21307E-07	-2.61031E-09
4.500E&02	2.01684E-02	8.22930E-07	-5.09281E-09
5.000E&02	4.94367E-02	1.29112E-06	-7.98321E-09
6.000E&02	1.00751E-01	1.84847E-06	-1.14148E-08
7.000E&02	8.04283E-05	5.23251E-08	-3.22835E-10
8.000E&02	1.74066E-00	-7.70798E-06	4.75258E-08
9.000E&02	2.05037E&01	-2.64807E-05	1.63193E-07
1.000E&03	1.12183E&02	-6.19885E-05	3.81868E-07

PRESSURE, ATM.	S2DP	S2EP
1.000E-00	2.14271E-14	-1.70184E-17
2.000E-00	2.92218E-14	-2.31783E-17
5.000E-00	3.24361E-14	-2.56103E-17
1.000E&01	1.67018E-14	-1.29332E-17
2.500E&01	-3.50012E-14	2.82420E-17
5.000E&01	-2.31238E-14	1.79734E-17
7.500E&01	5.36524E-14	-4.39961E-17
1.000E&02	1.03045E-13	-8.34397E-17
1.250E&02	6.73936E-14	-5.41312E-17
1.500E&02	-6.92666E-14	5.65827E-17
2.000E&02	-5.27248E-13	4.26290E-16
2.500E&02	-7.69593E-13	6.21205E-16
3.000E&02	-5.03429E-14	4.05068E-17
3.500E&02	2.35762E-12	-1.90094E-15
4.000E&02	6.89454E-12	-5.55695E-15
4.500E&02	1.34440E-11	-1.08330E-14
5.000E&02	2.10653E-11	-1.69708E-14
6.000E&02	3.01024E-11	-2.42446E-14
7.000E&02	8.51013E-13	-6.85282E-16
8.000E&02	-1.25243E-10	1.00839E-13
9.000E&02	-4.29963E-10	3.46146E-13
1.000E&03	-1.00592E-09	8.09760E-13

TABLE 2. - VARIANCES AND COVARIANCES AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-4

PRESSURE, ATM.	S2P	S2BP	S2CP
1.000E-00	3.35832E-09	6.89989E-11	-3.93896E-13
2.000E-00	6.77094E-09	9.51588E-11	-5.39308E-13
5.000E-00	1.13192E-08	1.09639E-10	-6.06527E-13
1.000E&01	1.01260E-08	6.51985E-11	-3.29061E-13
2.500E&01	1.48417E-08	-9.67878E-11	6.16448E-13
5.000E&01	1.69095E-08	-8.45416E-11	4.55456E-13
7.500E&01	3.50871E-08	1.31677E-10	-8.99254E-13
1.000E&02	7.44346E-08	2.84837E-10	-1.81367E-12
1.250E&02	4.32561E-08	2.02240E-10	-1.24869E-12
1.500E&02	5.39375E-08	-1.69860E-10	1.10411E-12
2.000E&02	1.52970E-06	-1.47044E-09	9.18952E-12
2.500E&02	3.28362E-06	-2.21794E-09	1.37670E-11
3.000E&02	7.46423E-08	-2.81889E-10	1.74171E-12
3.500E&02	2.68414E-05	6.44782E-09	-3.98009E-11
4.000E&02	2.38007E-04	1.92970E-08	-1.18927E-10
4.500E&02	9.19551E-04	3.80432E-08	-2.34188E-10
5.000E&02	2.28958E-03	6.01576E-08	-3.69992E-10
6.000E&02	4.92013E-03	8.84418E-08	-5.43250E-10
7.000E&02	7.33364E-05	1.08180E-08	-6.63906E-11
8.000E&02	7.37514E-02	-3.43524E-07	2.10683E-09
9.000E&02	9.44043E-01	-1.23027E-06	7.54148E-09
1.000E&03	5.52688E-00	-2.97906E-06	1.82542E-08

PRESSURE, ATM.	S2DP	S2EP
1.000E-00	1.00134E-15	-7.90661E-19
2.000E-00	1.36689E-15	-1.07785E-18
5.000E-00	1.52171E-15	-1.19451E-18
1.000E&01	7.92167E-16	-6.10095E-19
2.500E&01	-1.62836E-15	1.30641E-18
5.000E&01	-1.11309E-15	8.61146E-19
7.500E&01	2.46136E-15	-2.00735E-18
1.000E&02	4.82034E-15	-3.88080E-18
1.250E&02	3.26519E-15	-2.60825E-18
1.500E&02	-2.98710E-15	2.42779E-18
2.000E&02	-2.43035E-14	1.95352E-17
2.500E&02	-3.62822E-14	2.91150E-17
3.000E&02	-4.57428E-15	3.66346E-18
3.500E&02	1.04631E-13	-8.38692E-17
4.000E&02	3.12396E-13	-2.50311E-16
4.500E&02	6.14820E-13	-4.92504E-16
5.000E&02	9.70940E-13	-7.77624E-16
6.000E&02	1.42475E-12	-1.14076E-15
7.000E&02	1.74047E-13	-1.39329E-16
8.000E&02	-5.52154E-12	4.41952E-15
9.000E&02	-1.97600E-11	1.58145E-14
1.000E&03	-4.78209E-11	3.82694E-14

TABLE 2. - VARIANCES AND COVARIANCES AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-5

PRESSURE, ATM.	S2P	S2BP	S2CP
1.000E-00	7.68618E-08	1.59969E-09	-9.22001E-12
2.000E-00	1.54568E-07	2.20275E-09	-1.26032E-11
5.000E-00	2.56813E-07	2.52586E-09	-1.41023E-11
1.000E&01	2.28443E-07	1.47933E-09	-7.51395E-12
2.500E&01	3.39746E-07	-2.26817E-09	1.45556E-11
5.000E&01	3.80499E-07	-1.88097E-09	1.01545E-11
7.500E&01	8.21254E-07	3.17346E-09	-2.17841E-11
1.000E&02	1.69014E-06	6.60260E-09	-4.23999E-11
1.250E&02	9.19174E-07	4.40874E-09	-2.74207E-11
1.500E&02	1.41635E-06	-4.56227E-09	2.97938E-11
2.000E&02	3.66498E-05	-3.49513E-08	2.20467E-10
2.500E&02	7.27043E-05	-5.06167E-08	3.17165E-10
3.000E&02	5.82271E-07	-8.24643E-10	5.10084E-12
3.500E&02	7.36309E-04	1.63764E-07	-1.02055E-09
4.000E&02	6.07271E-03	4.72581E-07	-2.94047E-09
4.500E&02	2.27084E-02	9.16533E-07	-5.69629E-09
5.000E&02	5.50096E-02	1.42949E-06	-8.87656E-09
6.000E&02	1.07800E-01	2.00684E-06	-1.24457E-08
7.000E&02	2.51444E-04	-9.71039E-08	6.01676E-10
8.000E&02	2.12959E-00	-8.94826E-06	5.54095E-08
9.000E&02	2.42857E&01	-3.02478E-05	1.87208E-07
1.000E&03	1.31771E&02	-7.05118E-05	4.36237E-07

PRESSURE, ATM.	S2DP	S2EP
1.000E-00	2.36686E-14	-1.88841E-17
2.000E-00	3.22557E-14	-2.57008E-17
5.000E-00	3.57224E-14	-2.83322E-17
1.000E&01	1.82368E-14	-1.41809E-17
2.500E&01	-3.87997E-14	3.14454E-17
5.000E&01	-2.49532E-14	1.94643E-17
7.500E&01	6.01094E-14	-4.95003E-17
1.000E&02	1.13742E-13	-9.25125E-17
1.250E&02	7.23068E-14	-5.83231E-17
1.500E&02	-8.11639E-14	6.65655E-17
2.000E&02	-5.88722E-13	4.78147E-16
2.500E&02	-8.44044E-13	6.84394E-16
3.000E&02	-1.33423E-14	1.06977E-17
3.500E&02	2.70925E-12	-2.19440E-15
4.000E&02	7.79992E-12	-6.31530E-15
4.500E&02	1.51017E-11	-1.22241E-14
5.000E&02	2.35233E-11	-1.90374E-14
6.000E&02	3.29623E-11	-2.66690E-14
7.000E&02	-1.59287E-12	1.28851E-15
8.000E&02	-1.46647E-10	1.18610E-13
9.000E&02	-4.95356E-10	4.00609E-13
1.000E&03	-1.15408E-09	9.33266E-13

TABLE 2. - VARIANCES AND COVARIANCES AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-6

PRESSURE, ATM.	S2P	S2BP	S2CP
1.000E-00	4.93149E-08	1.01798E-09	-5.83072E-12
2.000E-00	9.93354E-08	1.40316E-09	-7.97863E-12
5.000E-00	1.65697E-07	1.61396E-09	-8.95708E-12
1.000E&01	1.47925E-07	9.54689E-10	-4.82913E-12
2.500E&01	2.17926E-07	-1.43329E-09	9.15251E-12
5.000E&01	2.46782E-07	-1.22961E-09	6.62957E-12
7.500E&01	5.19157E-07	1.96919E-09	-1.34713E-11
1.000E&02	1.08970E-06	4.20137E-09	-2.68305E-11
1.250E&02	6.18822E-07	2.92129E-09	-1.80830E-11
1.500E&02	8.30706E-07	-2.64319E-09	1.72062E-11
2.000E&02	2.28196E-05	-2.18804E-08	1.37183E-10
2.500E&02	4.76852E-05	-3.25487E-08	2.02696E-10
3.000E&02	7.18689E-07	-2.91831E-09	1.80817E-11
3.500E&02	4.20537E-04	9.82791E-08	-6.08665E-10
4.000E&02	3.63508E-03	2.90382E-07	-1.79556E-09
4.500E&02	1.38858E-02	5.69223E-07	-3.51572E-09
5.000E&02	3.42294E-02	8.95603E-07	-5.52665E-09
6.000E&02	7.09838E-02	1.29344E-06	-7.97143E-09
7.000E&02	2.96704E-04	8.37813E-08	-5.15884E-10
8.000E&02	1.13249E-00	-5.18301E-06	3.18937E-08
9.000E&02	1.33901E&01	-1.78397E-05	1.09722E-07
1.000E&03	7.22202E&01	-4.14628E-05	2.54915E-07

PRESSURE, ATM.	S2DP	S2EP
1.000E-00	1.48732E-14	-1.17867E-17
2.000E-00	2.02910E-14	-1.60586E-17
5.000E-00	2.25480E-14	-1.77636E-17
1.000E&01	1.16588E-14	-9.00952E-18
2.500E&01	-2.42532E-14	1.95270E-17
5.000E&01	-1.62340E-14	1.25960E-17
7.500E&01	3.69761E-14	-3.02579E-17
1.000E&02	7.15415E-14	-5.78030E-17
1.250E&02	4.74251E-14	-3.80127E-17
1.500E&02	-4.66590E-14	3.80410E-17
2.000E&02	-3.64033E-13	2.93673E-16
2.500E&02	-5.36016E-13	4.31698E-16
3.000E&02	-4.76110E-14	3.82488E-17
3.500E&02	1.60557E-12	-1.29167E-15
4.000E&02	4.73272E-12	-3.80600E-15
4.500E&02	9.26155E-12	-7.44611E-15
5.000E&02	1.45529E-11	-1.16979E-14
6.000E&02	2.09779E-11	-1.68579E-14
7.000E&02	1.35707E-12	-1.09033E-15
8.000E&02	-8.38736E-11	6.73790E-14
9.000E&02	-2.88480E-10	2.31723E-13
1.000E&03	-6.70098E-10	5.38217E-13

TABLE 2. - VARIANCES AND COVARIANCES AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-7

PRESSURE, ATM.	S2P	S2BP	S2CP
1.000E-00	1.23933E-08	2.56090E-10	-1.46858E-12
2.000E-00	2.49584E-08	3.52934E-10	-2.00926E-12
5.000E-00	4.16096E-08	4.05765E-10	-2.25452E-12
1.000E&01	3.71297E-08	2.39635E-10	-1.21320E-12
2.500E&01	5.47858E-08	-3.61046E-10	2.30780E-12
5.000E&01	6.19285E-08	-3.08067E-10	1.66168E-12
7.500E&01	1.30846E-07	4.97656E-10	-3.40692E-12
1.000E&02	2.73838E-07	1.05746E-09	-6.76044E-12
1.250E&02	1.54404E-07	7.30534E-10	-4.52645E-12
1.500E&02	2.12037E-07	-6.76181E-10	4.40450E-12
2.000E&02	5.77013E-06	-5.52315E-09	3.46686E-11
2.500E&02	1.19503E-05	-8.17820E-09	5.09897E-11
3.000E&02	1.57178E-07	-6.32847E-10	3.92466E-12
3.500E&02	1.07805E-04	2.49743E-08	-1.54855E-10
4.000E&02	9.23687E-04	7.34647E-08	-4.54808E-10
4.500E&02	3.51475E-03	1.43729E-07	-8.88782E-10
5.000E&02	8.64328E-03	2.25867E-07	-1.39546E-09
6.000E&02	1.78522E-02	3.25544E-07	-2.00871E-09
7.000E&02	3.76218E-05	1.49727E-08	-9.23048E-11
8.000E&02	3.10045E-01	-1.36104E-06	8.38520E-09
9.000E&02	3.83776E-00	-4.79324E-06	2.95158E-08
1.000E&03	2.23945E&01	-1.15876E-05	7.13264E-08

PRESSURE, ATM.	S2DP	S2EP
1.000E-00	3.75030E-15	-2.97553E-18
2.000E-00	5.11556E-15	-4.05331E-18
5.000E-00	5.68159E-15	-4.48127E-18
1.000E&01	2.93173E-15	-2.26800E-18
2.500E&01	-6.12182E-15	4.93456E-18
5.000E&01	-4.07173E-15	3.16227E-18
7.500E&01	9.36003E-15	-7.66789E-18
1.000E&02	1.80453E-14	-1.45969E-17
1.250E&02	1.18827E-14	-9.53494E-18
1.500E&02	-1.19532E-14	9.75544E-18
2.000E&02	-9.20983E-14	7.43848E-17
2.500E&02	-1.34987E-13	1.08844E-16
3.000E&02	-1.03407E-14	8.31466E-18
3.500E&02	4.08940E-13	-3.29378E-16
4.000E&02	1.20010E-12	-9.66249E-16
4.500E&02	2.34393E-12	-1.88670E-15
5.000E&02	3.67864E-12	-2.96047E-15
6.000E&02	5.29209E-12	-4.25776E-15
7.000E&02	2.43083E-13	-1.95536E-16
8.000E&02	-2.20757E-11	1.77553E-14
9.000E&02	-7.76886E-11	6.24777E-14
1.000E&03	-1.87704E-10	1.50940E-13

TABLE 2. - VARIANCES AND COVARIANCES AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-8

PRESSURE, ATM.	S2P	S2BP	S2CP
1.000E-00	9.35609E-09	1.93808E-10	-1.11334E-12
2.000E-00	1.88325E-08	2.67021E-10	-1.52277E-12
5.000E-00	3.13600E-08	3.06716E-10	-1.70701E-12
1.000E&01	2.79532E-08	1.80622E-10	-9.15463E-13
2.500E&01	4.13575E-08	-2.73776E-10	1.75235E-12
5.000E&01	4.66000E-08	-2.31331E-10	1.24816E-12
7.500E&01	9.91884E-08	3.79341E-10	-2.59934E-12
1.000E&02	2.06389E-07	8.00181E-10	-5.12348E-12
1.250E&02	1.14933E-07	5.46427E-10	-3.39014E-12
1.500E&02	1.64231E-07	-5.25852E-10	3.42817E-12
2.000E&02	4.39184E-06	-4.19858E-09	2.63988E-11
2.500E&02	8.96045E-06	-6.16904E-09	3.85290E-11
3.000E&02	9.45789E-08	-3.47354E-10	2.15623E-12
3.500E&02	8.41766E-05	1.92240E-08	-1.19406E-10
4.000E&02	7.11483E-04	5.61639E-08	-3.48305E-10
4.500E&02	2.69079E-03	1.09545E-07	-6.78573E-10
5.000E&02	6.58323E-03	1.71706E-07	-1.06268E-09
6.000E&02	1.33639E-02	2.45346E-07	-1.51650E-09
7.000E&02	2.48047E-06	3.34884E-09	-2.06812E-11
8.000E&02	2.44262E-01	-1.05228E-06	6.49429E-09
9.000E&02	2.95512E-00	-3.66372E-06	2.25999E-08
1.000E&03	1.69570E&01	-8.78300E-06	5.41571E-08

PRESSURE, ATM.	S2DP	S2EP
1.000E-00	2.84830E-15	-2.26427E-18
2.000E-00	3.88399E-15	-3.08346E-18
5.000E-00	4.30949E-15	-3.40562E-18
1.000E&01	2.21557E-15	-1.71705E-18
2.500E&01	-4.65628E-15	3.76037E-18
5.000E&01	-3.06150E-15	2.38132E-18
7.500E&01	7.15210E-15	-5.86980E-18
1.000E&02	1.36996E-14	-1.11028E-17
1.250E&02	8.91361E-15	-7.16549E-18
1.500E&02	-9.31572E-15	7.61580E-18
2.000E&02	-7.02558E-14	5.68536E-17
2.500E&02	-1.02184E-13	8.25556E-17
3.000E&02	-5.68462E-15	4.57597E-18
3.500E&02	3.15902E-13	-2.54938E-16
4.000E&02	9.20752E-13	-7.42783E-16
4.500E&02	1.79283E-12	-1.44593E-15
5.000E&02	2.80652E-12	-2.26303E-15
6.000E&02	4.00265E-12	-3.22664E-15
7.000E&02	5.45634E-14	-4.39767E-17
8.000E&02	-1.71288E-11	1.38035E-14
9.000E&02	-5.95942E-11	4.80198E-14
1.000E&03	-1.42782E-10	1.15042E-13

TABLE 2. - VARIANCES AND COVARIANCES AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-9

PRESSURE, ATM.	S2P	S2BP	S2CP
1.000E-00	3.51746E-07	7.47845E-09	-4.38413E-11
2.000E-00	7.04307E-07	1.02703E-08	-5.97639E-11
5.000E-00	1.15814E-06	1.16805E-08	-6.62904E-11
1.000E&01	1.02077E-06	6.65913E-09	-3.42044E-11
2.500E&01	1.55605E-06	-1.07926E-08	7.02099E-11
5.000E&01	1.69445E-06	-8.15157E-09	4.41091E-11
7.500E&01	3.90678E-06	1.57952E-08	-1.09521E-10
1.000E&02	7.61151E-06	3.08041E-08	-2.00828E-10
1.250E&02	3.68507E-06	1.82366E-08	-1.14825E-10
1.500E&02	8.21944E-06	-2.65370E-08	1.75162E-10
2.000E&02	1.81038E-04	-1.70353E-07	1.09240E-09
2.500E&02	3.10702E-04	-2.29000E-07	1.45911E-09
3.000E&02	1.51159E-05	4.58819E-08	-2.91640E-10
3.500E&02	4.51497E-03	8.87269E-07	-5.62341E-09
4.000E&02	3.32677E-02	2.41939E-06	-1.53104E-08
4.500E&02	1.17749E-01	4.56460E-06	-2.88535E-08
5.000E&02	2.71979E-01	6.95148E-06	-4.39033E-08
6.000E&02	4.49729E-01	8.96390E-06	-5.65423E-08
7.000E&02	7.43175E-02	-3.65058E-06	2.30071E-08
8.000E&02	1.54263E&01	-5.26637E-05	3.31693E-07
9.000E&02	1.61743E&02	-1.70692E-04	1.07455E-06
1.000E&03	8.89624E&02	-4.00618E-04	2.52102E-06

PRESSURE, ATM.	S2DP	S2EP
1.000E-00	1.14465E-13	-9.29788E-17
2.000E-00	1.55557E-13	-1.26184E-16
5.000E-00	1.70734E-13	-1.37843E-16
1.000E&01	8.41867E-14	-6.65526E-17
2.500E&01	-1.90127E-13	1.56805E-16
5.000E&01	-1.09306E-13	8.64235E-17
7.500E&01	3.06542E-13	-2.56724E-16
1.000E&02	5.47497E-13	-4.53207E-16
1.250E&02	3.07055E-13	-2.51779E-16
1.500E&02	-4.83543E-13	4.03039E-16
2.000E&02	-2.96623E-12	2.45250E-15
2.500E&02	-3.94894E-12	3.25988E-15
3.000E&02	7.89199E-13	-6.51646E-16
3.500E&02	1.51829E-11	-1.25202E-14
4.000E&02	4.13061E-11	-3.40500E-14
4.500E&02	7.78022E-11	-6.41187E-14
5.000E&02	1.18335E-10	-9.75044E-14
6.000E&02	1.52312E-10	-1.25467E-13
7.000E&02	-6.19515E-11	5.10229E-14
8.000E&02	-8.92890E-10	7.35280E-13
9.000E&02	-2.89196E-09	2.38123E-12
1.000E&03	-6.78367E-09	5.58522E-12

TABLE 2.- VARIANCES AND COVARIANCES AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-10

PRESSURE, ATM.	S2P	S2BP	S2CP
1.000E-00	7.48859E-08	1.53411E-09	-8.74348E-12
2.000E-00	1.51066E-07	2.11645E-09	-1.19753E-11
5.000E-00	2.52874E-07	2.44090E-09	-1.34820E-11
1.000E&01	2.26496E-07	1.45591E-09	-7.34085E-12
2.500E&01	3.31006E-07	-2.14755E-09	1.36607E-11
5.000E&01	3.78435E-07	-1.89502E-09	1.02069E-11
7.500E&01	7.79199E-07	2.90580E-09	-1.98286E-11
1.000E&02	1.66322E-06	6.33553E-09	-4.02819E-11
1.250E&02	9.79080E-07	4.55058E-09	-2.80613E-11
1.500E&02	1.17157E-06	-3.66331E-09	2.37978E-11
2.000E&02	3.38394E-05	-3.25540E-08	2.03115E-10
2.500E&02	7.37282E-05	-4.94811E-08	3.06626E-10
3.000E&02	2.06828E-06	-7.29811E-09	4.50254E-11
3.500E&02	5.77279E-04	1.40785E-07	-8.67584E-10
4.000E&02	5.19250E-03	4.24382E-07	-2.61108E-09
4.500E&02	2.01868E-02	8.39267E-07	-5.15773E-09
5.000E&02	5.05534E-02	1.33096E-06	-8.17219E-09
6.000E&02	1.11044E-01	1.97833E-06	-1.21313E-08
7.000E&02	2.62433E-03	3.04708E-07	-1.86684E-09
8.000E&02	1.64757E-00	-7.64504E-06	4.68078E-08
9.000E&02	2.27414E&01	-2.84314E-05	1.73988E-07
1.000E&03	1.46764E&02	-7.22833E-05	4.42168E-07

PRESSURE, ATM.	S2DP	S2EP
1.000E-00	2.21860E-14	-1.74829E-17
2.000E-00	3.02956E-14	-2.38417E-17
5.000E-00	3.37634E-14	-2.64508E-17
1.000E&01	1.76448E-14	-1.35642E-17
2.500E&01	-3.60230E-14	2.88446E-17
5.000E&01	-2.49187E-14	1.92477E-17
7.500E&01	5.41903E-14	-4.41120E-17
1.000E&02	1.06870E-13	-8.58705E-17
1.250E&02	7.32591E-14	-5.84099E-17
1.500E&02	-6.43041E-14	5.21746E-17
2.000E&02	-5.36184E-13	4.30124E-16
2.500E&02	-8.06589E-13	6.45956E-16
3.000E&02	-1.18062E-13	9.43815E-17
3.500E&02	2.27649E-12	-1.82109E-15
4.000E&02	6.84588E-12	-5.47430E-15
4.500E&02	1.35153E-11	-1.08047E-14
5.000E&02	2.14053E-11	-1.71089E-14
6.000E&02	3.17565E-11	-2.53754E-14
7.000E&02	4.88484E-12	-3.90255E-15
8.000E&02	-1.22442E-10	9.78072E-14
9.000E&02	-4.55024E-10	3.63436E-13
1.000E&03	-1.15617E-09	9.23380E-13

TABLE 2. - VARIANCES AND COVARIANCES AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-11

PRESSURE, ATM.	S2P	S2BP	S2CP
1.000E-00	1.84691E-08	3.80843E-10	-2.18047E-12
2.000E-00	3.72095E-08	5.24998E-10	-2.98403E-12
5.000E-00	6.20958E-08	6.04053E-10	-3.35103E-12
1.000E&01	5.54614E-08	3.57624E-10	-1.80855E-12
2.500E&01	8.16409E-08	-5.35981E-10	3.42160E-12
5.000E&01	9.25449E-08	-4.61216E-10	2.48675E-12
7.500E&01	1.94273E-07	7.35360E-10	-5.02980E-12
1.000E&02	4.08598E-07	1.57259E-09	-1.00393E-11
1.250E&02	2.32919E-07	1.09734E-09	-6.79077E-12
1.500E&02	3.08862E-07	-9.81000E-10	6.38506E-12
2.000E&02	8.53250E-06	-8.17914E-09	5.12598E-11
2.500E&02	1.79023E-05	-1.21923E-08	7.58966E-11
3.000E&02	2.88040E-07	-1.16477E-09	7.21466E-12
3.500E&02	1.55865E-04	3.65785E-08	-2.26444E-10
4.000E&02	1.35184E-03	1.08260E-07	-6.69147E-10
4.500E&02	5.17218E-03	2.12388E-07	-1.31123E-09
5.000E&02	1.27771E-02	3.34526E-07	-2.06345E-09
6.000E&02	2.67867E-02	4.85763E-07	-2.99247E-09
7.000E&02	1.46597E-04	3.60037E-08	-2.21599E-10
8.000E&02	4.42692E-01	-1.98113E-06	1.21857E-08
9.000E&02	5.56537E-00	-7.03140E-06	4.32279E-08
1.000E&03	3.26947E&01	-1.70556E-05	1.04813E-07

PRESSURE, ATM.	S2DP	S2EP
1.000E-00	5.55917E-15	-4.40305E-18
2.000E-00	7.58496E-15	-5.99951E-18
5.000E-00	8.43135E-15	-6.63866E-18
1.000E&01	4.36442E-15	-3.37089E-18
2.500E&01	-9.06260E-15	7.29266E-18
5.000E&01	-6.08770E-15	4.72141E-18
7.500E&01	1.38000E-14	-1.12868E-17
1.000E&02	2.67558E-14	-2.16059E-17
1.250E&02	1.78018E-14	-1.42613E-17
1.500E&02	-1.73084E-14	1.41047E-17
2.000E&02	-1.35954E-13	1.09616E-16
2.500E&02	-2.00597E-13	1.61468E-16
3.000E&02	-1.89902E-14	1.52492E-17
3.500E&02	5.97016E-13	-4.80026E-16
4.000E&02	1.76279E-12	-1.41682E-15
4.500E&02	3.45239E-12	-2.77410E-15
5.000E&02	5.43066E-12	-4.36285E-15
6.000E&02	7.87098E-12	-6.32159E-15
7.000E&02	5.82624E-13	-4.67847E-16
8.000E&02	-3.20289E-11	2.57157E-14
9.000E&02	-1.13594E-10	9.11940E-14
1.000E&03	-2.75380E-10	2.21058E-13

TABLE 2. - VARIANCES AND COVARIANCES AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-12

PRESSURE, ATM.	S2P	S2BP	S2CP
1.000E-00	7.15005E-08	1.48452E-09	-8.54571E-12
2.000E-00	1.43852E-07	2.04471E-09	-1.16848E-11
5.000E-00	2.39270E-07	2.34651E-09	-1.30857E-11
1.000E&01	2.13057E-07	1.37771E-09	-6.99300E-12
2.500E&01	3.16128E-07	-2.10167E-09	1.34745E-11
5.000E&01	3.55006E-07	-1.75770E-09	9.48931E-12
7.500E&01	7.61596E-07	2.92854E-09	-2.00907E-11
1.000E&02	1.57545E-06	6.13077E-09	-3.93270E-11
1.250E&02	8.65764E-07	4.13488E-09	-2.56948E-11
1.500E&02	1.29071E-06	-4.14632E-09	2.70611E-11
2.000E&02	3.39050E-05	-3.23390E-08	2.03740E-10
2.500E&02	6.80920E-05	-4.71305E-08	2.94953E-10
3.000E&02	5.95066E-07	-1.60071E-09	9.93872E-12
3.500E&02	6.66797E-04	1.49944E-07	-9.33265E-10
4.000E&02	5.55579E-03	4.34926E-07	-2.70277E-09
4.500E&02	2.08741E-02	8.45511E-07	-5.24826E-09
5.000E&02	5.08043E-02	1.32183E-06	-8.19765E-09
6.000E&02	1.01511E-01	1.87381E-06	-1.16060E-08
7.000E&02	4.68708E-05	-4.03397E-08	2.49636E-10
8.000E&02	2.01055E-00	-8.36594E-06	5.17379E-08
9.000E&02	2.45093E&01	-2.92383E-05	1.80730E-07
1.000E&03	1.45114E&02	-7.11992E-05	4.39930E-07

PRESSURE, ATM.	S2DP	S2EP
1.000E-00	2.19061E-14	-1.74507E-17
2.000E-00	2.98622E-14	-2.37567E-17
5.000E-00	3.31006E-14	-2.62123E-17
1.000E&01	1.69526E-14	-1.31636E-17
2.500E&01	-3.58701E-14	2.90272E-17
5.000E&01	-2.33019E-14	1.81548E-17
7.500E&01	5.53705E-14	-4.55315E-17
1.000E&02	1.05354E-13	-8.55590E-17
1.250E&02	6.76736E-14	-5.45074E-17
1.500E&02	-7.36409E-14	6.03125E-17
2.000E&02	-5.43274E-13	4.40549E-16
2.500E&02	-7.83799E-13	6.34554E-16
3.000E&02	-2.61754E-14	2.10721E-17
3.500E&02	2.47392E-12	-2.00066E-15
4.000E&02	7.15898E-12	-5.78729E-15
4.500E&02	1.38937E-11	-1.12287E-14
5.000E&02	2.16926E-11	-1.75283E-14
6.000E&02	3.06936E-11	-2.47946E-14
7.000E&02	-6.59925E-13	5.32993E-16
8.000E&02	-1.36730E-10	1.10416E-13
9.000E&02	-4.77518E-10	3.85579E-13
1.000E&03	-1.16215E-09	9.38322E-13

TABLE 2. - VARIANCES AND COVARIANCES AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-13

PRESSURE, ATM.	S2P	S2BP	S2CP
1.000E-00	4.63475E-08	9.45942E-10	-5.36899E-12
2.000E-00	9.35783E-08	1.30577E-09	-7.35809E-12
5.000E-00	1.56985E-07	1.50879E-09	-8.30081E-12
1.000E&01	1.40890E-07	9.05615E-10	-4.55414E-12
2.500E&01	2.04586E-07	-1.31657E-09	8.34670E-12
5.000E&01	2.35638E-07	-1.18701E-09	6.38638E-12
7.500E&01	4.76062E-07	1.75466E-09	-1.19486E-11
1.000E&02	1.02666E-06	3.89055E-09	-2.46451E-11
1.250E&02	6.21156E-07	2.86079E-09	-1.75819E-11
1.500E&02	6.83363E-07	-2.09993E-09	1.36224E-11
2.000E&02	2.04502E-05	-1.98027E-08	1.23064E-10
2.500E&02	4.62892E-05	-3.07009E-08	1.89478E-10
3.000E&02	2.03535E-06	-6.01766E-09	3.69845E-11
3.500E&02	3.31210E-04	8.35142E-08	-5.12553E-10
4.000E&02	3.10860E-03	2.57184E-07	-1.57590E-09
4.500E&02	1.22936E-02	5.12995E-07	-3.13973E-09
5.000E&02	3.09742E-02	8.16032E-07	-4.98998E-09
6.000E&02	6.69833E-02	1.20353E-06	-7.35004E-09
7.000E&02	2.95596E-03	2.53310E-07	-1.54560E-09
8.000E&02	5.75685E-01	-3.53981E-06	2.15845E-08
9.000E&02	5.64234E-00	-1.10931E-05	6.76081E-08
1.000E&03	2.23610E&01	-2.21006E-05	1.34642E-07

PRESSURE, ATM.	S2DP	S2EP
1.000E-00	1.35676E-14	-1.06421E-17
2.000E-00	1.85388E-14	-1.45222E-17
5.000E-00	2.07051E-14	-1.61468E-17
1.000E&01	1.09109E-14	-8.35263E-18
2.500E&01	-2.19238E-14	1.74748E-17
5.000E&01	-1.55549E-14	1.19704E-17
7.500E&01	3.25424E-14	-2.63739E-17
1.000E&02	6.51236E-14	-5.20863E-17
1.250E&02	4.57311E-14	-3.63002E-17
1.500E&02	-3.67126E-14	2.96703E-17
2.000E&02	-3.23534E-13	2.58332E-16
2.500E&02	-4.96369E-13	3.95666E-16
3.000E&02	-9.66185E-14	7.69011E-17
3.500E&02	1.33933E-12	-1.06641E-15
4.000E&02	4.11464E-12	-3.27493E-15
4.500E&02	8.19321E-12	-6.51946E-15
5.000E&02	1.30159E-11	-1.03549E-14
6.000E&02	1.91604E-11	-1.52390E-14
7.000E&02	4.02751E-12	-3.20262E-15
8.000E&02	-5.62278E-11	4.47055E-14
9.000E&02	-1.76079E-10	1.39982E-13
1.000E&03	-3.50600E-10	2.78703E-13

TABLE 2. - VARIANCES AND COVARIANCES AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-14

PRESSURE, ATM.	S2P	S2BP	S2CP
1.000E-00	1.66375E-08	3.45816E-10	-1.99168E-12
2.000E-00	3.34664E-08	4.76253E-10	-2.72294E-12
5.000E-00	5.56383E-08	5.46356E-10	-3.04825E-12
1.000E&01	4.95214E-08	3.20435E-10	-1.62686E-12
2.500E&01	7.35543E-08	-4.89900E-10	3.14209E-12
5.000E&01	8.25044E-08	-4.08247E-10	2.20392E-12
7.500E&01	1.77438E-07	6.83745E-10	-4.69186E-12
1.000E&02	3.66225E-07	1.42763E-09	-9.16193E-12
1.250E&02	2.00380E-07	9.58832E-10	-5.96042E-12
1.500E&02	3.02893E-07	-9.74217E-10	6.35983E-12
2.000E&02	7.90509E-06	-7.54118E-09	4.75342E-11
2.500E&02	1.57947E-05	-1.09616E-08	6.86351E-11
3.000E&02	1.32042E-07	-2.90809E-10	1.80419E-12
3.500E&02	1.56936E-04	3.51284E-08	-2.18753E-10
4.000E&02	1.30214E-03	1.01679E-07	-6.32191E-10
4.500E&02	4.88275E-03	1.97471E-07	-1.22637E-09
5.000E&02	1.18577E-02	3.08378E-07	-1.91346E-09
6.000E&02	2.34573E-02	4.34975E-07	-2.69555E-09
7.000E&02	2.57633E-05	-1.44423E-08	8.94209E-11
8.000E&02	4.58161E-01	-1.92851E-06	1.19327E-08
9.000E&02	5.34473E-00	-6.59332E-06	4.07764E-08
1.000E&03	2.97698E&01	-1.55726E-05	9.62712E-08

PRESSURE, ATM.	S2DP	S2EP
1.000E-00	5.10857E-15	-4.07228E-18
2.000E-00	6.96308E-15	-5.54314E-18
5.000E-00	7.71518E-15	-6.11368E-18
1.000E&01	3.94579E-15	-3.06575E-18
2.500E&01	-8.36915E-15	6.77698E-18
5.000E&01	-5.41355E-15	4.21992E-18
7.500E&01	1.29374E-14	-1.06452E-17
1.000E&02	2.45584E-14	-1.99572E-17
1.250E&02	1.57062E-14	-1.26583E-17
1.500E&02	-1.73147E-14	1.41894E-17
2.000E&02	-1.26827E-13	1.02915E-16
2.500E&02	-1.82500E-13	1.47849E-16
3.000E&02	-4.74446E-15	3.81657E-18
3.500E&02	5.80235E-13	-4.69552E-16
4.000E&02	1.67555E-12	-1.35542E-15
4.500E&02	3.24859E-12	-2.62724E-15
5.000E&02	5.06653E-12	-4.09668E-15
6.000E&02	7.13310E-12	-5.76607E-15
7.000E&02	-2.36533E-13	1.91167E-16
8.000E&02	-3.15549E-11	2.54992E-14
9.000E&02	-1.07804E-10	8.71068E-14
1.000E&03	-2.54475E-10	2.05601E-13

TABLE 2. - VARIANCES AND COVARIANCES AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-15

PRESSURE, ATM.	S2P	S2BP	S2CP
1.000E-00	3.60059E-08	7.37963E-10	-4.20547E-12
2.000E-00	7.26291E-08	1.01805E-09	-5.75975E-12
5.000E-00	1.21556E-07	1.17402E-09	-6.48383E-12
1.000E&01	1.08859E-07	7.00121E-10	-3.52954E-12
2.500E&01	1.59120E-07	-1.03305E-09	6.57053E-12
5.000E&01	1.81883E-07	-9.11053E-10	4.90624E-12
7.500E&01	3.74579E-07	1.39775E-09	-9.53691E-12
1.000E&02	7.99128E-07	3.04623E-09	-1.93663E-11
1.250E&02	4.70192E-07	2.18695E-09	-1.34844E-11
1.500E&02	5.63464E-07	-1.76282E-09	1.14506E-11
2.000E&02	1.62567E-05	-1.56515E-08	9.76472E-11
2.500E&02	3.54152E-05	-2.37887E-08	1.47402E-10
3.000E&02	9.90467E-07	-3.50110E-09	2.15980E-11
3.500E&02	2.77832E-04	6.77506E-08	-4.17475E-10
4.000E&02	2.49996E-03	2.04264E-07	-1.25666E-09
4.500E&02	9.72031E-03	4.03983E-07	-2.48249E-09
5.000E&02	2.43261E-02	6.40451E-07	-3.93208E-09
6.000E&02	5.31112E-02	9.49079E-07	-5.81940E-09
7.000E&02	1.22769E-03	1.44569E-07	-8.85659E-10
8.000E&02	7.49817E-01	-3.57760E-06	2.19027E-08
9.000E&02	9.75231E-00	-1.29152E-05	7.90297E-08
1.000E&03	5.73237E&01	-3.13366E-05	1.91676E-07

PRESSURE, ATM.	S2DP	S2EP
1.000E-00	1.06712E-14	-8.40939E-18
2.000E-00	1.45714E-14	-1.14675E-17
5.000E-00	1.62379E-14	-1.27213E-17
1.000E&01	8.48377E-15	-6.52192E-18
2.500E&01	-1.73264E-14	1.38740E-17
5.000E&01	-1.19774E-14	9.25174E-18
7.500E&01	2.60638E-14	-2.12170E-17
1.000E&02	5.13808E-14	-4.12857E-17
1.250E&02	3.52036E-14	-2.80686E-17
1.500E&02	-3.09410E-14	2.51053E-17
2.000E&02	-2.57775E-13	2.06792E-16
2.500E&02	-3.87754E-13	3.10542E-16
3.000E&02	-5.66339E-14	4.52756E-17
3.500E&02	1.09545E-12	-8.76346E-16
4.000E&02	3.29487E-12	-2.63482E-15
4.500E&02	6.50525E-12	-5.20073E-15
5.000E&02	1.02994E-11	-8.23249E-15
6.000E&02	1.52338E-11	-1.21732E-14
7.000E&02	2.31750E-12	-1.85153E-15
8.000E&02	-5.72955E-11	4.57692E-14
9.000E&02	-2.06687E-10	1.65090E-13
1.000E&03	-5.01202E-10	4.00299E-13

TABLE 2.- VARIANCES AND COVARIANCES AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-16

PRESSURE, ATM.	S2P	S2BP	S2CP
1.000E-00	5.70592E-10	1.17203E-11	-6.69190E-14
2.000E-00	1.15045E-09	1.61641E-11	-9.16244E-14
5.000E-00	1.92341E-09	1.86243E-11	-1.03047E-13
1.000E&01	1.72085E-09	1.10756E-11	-5.59101E-14
2.500E&01	2.52229E-09	-1.64424E-11	1.04738E-13
5.000E&01	2.87382E-09	-1.43650E-11	7.74057E-14
7.500E&01	5.96269E-09	2.23697E-11	-1.52789E-13
1.000E&02	1.26527E-08	4.83977E-11	-3.08213E-13
1.250E&02	7.35410E-09	3.43702E-11	-2.12244E-13
1.500E&02	9.16530E-09	-2.88558E-11	1.87591E-13
2.000E&02	2.60103E-07	-2.49884E-10	1.56187E-12
2.500E&02	5.58422E-07	-3.76941E-10	2.34004E-12
3.000E&02	1.27113E-08	-4.79637E-11	2.96396E-13
3.500E&02	4.56180E-06	1.09545E-09	-6.76295E-12
4.000E&02	4.04462E-05	3.27831E-09	-2.02070E-11
4.500E&02	1.56259E-04	6.46290E-09	-3.97904E-11
5.000E&02	3.89164E-04	1.02210E-08	-6.28720E-11
6.000E&02	8.38169E-04	1.50435E-08	-9.24174E-11
7.000E&02	1.26021E-05	1.84810E-09	-1.13434E-11
8.000E&02	1.28054E-02	-5.89907E-08	3.61841E-10
9.000E&02	1.67683E-01	-2.13680E-07	1.31003E-09
1.000E&03	1.01691E-00	-5.26621E-07	3.22733E-09

PRESSURE, ATM.	S2DP	S2EP
1.000E-00	1.70122E-16	-1.34328E-19
2.000E-00	2.32229E-16	-1.83123E-19
5.000E-00	2.58542E-16	-2.02950E-19
1.000E&01	1.34599E-16	-1.03663E-19
2.500E&01	-2.76676E-16	2.21974E-19
5.000E&01	-1.89181E-16	1.46362E-19
7.500E&01	4.18207E-16	-3.41065E-19
1.000E&02	8.19174E-16	-6.59506E-19
1.250E&02	5.55010E-16	-4.43346E-19
1.500E&02	-5.07520E-16	4.12490E-19
2.000E&02	-4.13073E-15	3.32028E-18
2.500E&02	-6.16714E-15	4.94887E-18
3.000E&02	-7.78443E-16	6.23442E-19
3.500E&02	1.77791E-14	-1.42511E-17
4.000E&02	5.30802E-14	-4.25311E-17
4.500E&02	1.04464E-13	-8.36811E-17
5.000E&02	1.64992E-13	-1.32141E-16
6.000E&02	2.42381E-13	-1.94068E-16
7.000E&02	2.97380E-14	-2.38059E-17
8.000E&02	-9.48320E-13	7.59046E-16
9.000E&02	-3.43256E-12	2.74717E-15
1.000E&03	-8.45479E-12	6.76604E-15

TABLE 2.- VARIANCES AND COVARIANCES AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-17

PRESSURE, ATM.	S2P	S2BP	S2CP
1.000E-00	2.23332E-09	4.63617E-11	-2.66878E-13
2.000E-00	4.49338E-09	6.38569E-11	-3.64913E-13
5.000E-00	7.47435E-09	7.32837E-11	-4.08671E-13
1.000E&01	6.65621E-09	4.30290E-11	-2.18401E-13
2.500E&01	9.87637E-09	-6.56397E-11	4.20841E-13
5.000E&01	1.10917E-08	-5.49103E-11	2.96452E-13
7.500E&01	2.37921E-08	9.14582E-11	-6.27440E-13
1.000E&02	4.92289E-08	1.91506E-10	-1.22844E-12
1.250E&02	2.70623E-08	1.29207E-10	-8.02920E-13
1.500E&02	4.02992E-08	-1.29428E-10	8.44724E-13
2.000E&02	1.05931E-06	-1.01011E-09	6.36375E-12
2.500E&02	2.12836E-06	-1.47244E-09	9.21479E-12
3.000E&02	1.86894E-08	-5.10993E-11	3.17298E-13
3.500E&02	2.08058E-05	4.68046E-09	-2.91310E-11
4.000E&02	1.73404E-04	1.35779E-08	-8.43767E-11
4.500E&02	6.51617E-04	2.63981E-08	-1.63856E-10
5.000E&02	1.58653E-03	4.12774E-08	-2.55987E-10
6.000E&02	3.17769E-03	5.85850E-08	-3.62859E-10
7.000E&02	1.29461E-06	-1.18471E-09	7.33133E-12
8.000E&02	6.37315E-02	-2.63206E-07	1.62773E-09
9.000E&02	7.90987E-01	-9.28183E-07	5.73727E-09
1.000E&03	4.81445E-00	-2.29168E-06	1.41598E-08

PRESSURE, ATM.	S2DP	S2EP
1.000E-00	6.84080E-16	-5.44912E-19
2.000E-00	9.32541E-16	-7.41827E-19
5.000E-00	1.03368E-15	-8.18518E-19
1.000E&01	5.29424E-16	-4.11066E-19
2.500E&01	-1.12025E-15	9.06482E-19
5.000E&01	-7.27947E-16	5.67121E-19
7.500E&01	1.72916E-15	-1.42180E-18
1.000E&02	3.29076E-15	-2.67227E-18
1.250E&02	2.11459E-15	-1.70308E-18
1.500E&02	-2.29863E-15	1.88247E-18
2.000E&02	-1.69681E-14	1.37587E-17
2.500E&02	-2.44858E-14	1.98220E-17
3.000E&02	-8.35754E-16	6.72840E-19
3.500E&02	7.72174E-14	-6.24413E-17
4.000E&02	2.23481E-13	-1.80649E-16
4.500E&02	4.33753E-13	-3.50530E-16
5.000E&02	6.77358E-13	-5.47289E-16
6.000E&02	9.59574E-13	-7.75100E-16
7.000E&02	-1.93796E-14	1.56510E-17
8.000E&02	-4.30148E-12	3.47341E-15
9.000E&02	-1.51579E-11	1.22386E-14
1.000E&03	-3.74037E-11	3.01975E-14

TABLE 2. - VARIANCES AND COVARIANCES AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-18

PRESSURE, ATM.	S2P	S2BP	S2CP
1.000E-00	9.02215E-08	1.85497E-09	-1.06024E-11
2.000E-00	1.81871E-07	2.55795E-09	-1.45146E-11
5.000E-00	3.03918E-07	2.94601E-09	-1.63166E-11
1.000E&01	2.71805E-07	1.74946E-09	-8.83782E-12
2.500E&01	3.98961E-07	-2.60546E-09	1.66112E-11
5.000E&01	4.53825E-07	-2.26548E-09	1.22122E-11
7.500E&01	9.45208E-07	3.55484E-09	-2.42949E-11
1.000E&02	2.00043E-06	7.66307E-09	-4.88471E-11
1.250E&02	1.15549E-06	5.41190E-09	-3.34482E-11
1.500E&02	1.46917E-06	-4.63802E-09	3.01670E-11
2.000E&02	4.13537E-05	-3.96693E-08	2.48199E-10
2.500E&02	8.81223E-05	-5.96084E-08	3.70429E-10
3.000E&02	1.79763E-06	-6.97741E-09	4.31577E-11
3.500E&02	7.34375E-04	1.74964E-07	-1.08128E-09
4.000E&02	6.46188E-03	5.21609E-07	-3.21847E-09
4.500E&02	2.48818E-02	1.02658E-06	-6.32702E-09
5.000E&02	6.18260E-02	1.62167E-06	-9.98572E-09
6.000E&02	1.32485E-01	2.38076E-06	-1.46410E-08
7.000E&02	1.53273E-03	2.56558E-07	-1.57636E-09
8.000E&02	2.14508E-00	-9.61070E-06	5.90124E-08
9.000E&02	2.88100E&01	-3.52563E-05	2.16375E-07
1.000E&03	1.83968E&02	-8.91604E-05	5.46980E-07

PRESSURE, ATM.	S2DP	S2EP
1.000E-00	2.69798E-14	-2.13248E-17
2.000E-00	3.68240E-14	-2.90668E-17
5.000E-00	4.09768E-14	-3.21982E-17
1.000E&01	2.12936E-14	-1.64149E-17
2.500E&01	-4.39198E-14	3.52713E-17
5.000E&01	-2.98648E-14	2.31243E-17
7.500E&01	6.65525E-14	-5.43277E-17
1.000E&02	1.29947E-13	-1.04722E-16
1.250E&02	8.75401E-14	-6.99945E-17
1.500E&02	-8.16688E-14	6.64340E-17
2.000E&02	-6.57047E-13	5.28667E-16
2.500E&02	-9.77198E-13	7.84954E-16
3.000E&02	-1.13437E-13	9.09318E-17
3.500E&02	2.84535E-12	-2.28304E-15
4.000E&02	8.46252E-12	-6.78756E-15
4.500E&02	1.66267E-11	-1.33324E-14
5.000E&02	2.62304E-11	-2.10291E-14
6.000E&02	3.84360E-11	-3.08059E-14
7.000E&02	4.13660E-12	-3.31481E-15
8.000E&02	-1.54810E-10	1.24037E-13
9.000E&02	-5.67500E-10	4.54647E-13
1.000E&03	-1.43433E-09	1.14901E-12

TABLE 2.- VARIANCES AND COVARIANCES AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-19

PRESSURE, ATM.	S2P	S2BP	S2CP
1.000E-00	3.69160E-08	7.70478E-10	-4.45291E-12
2.000E-00	7.41937E-08	1.06053E-09	-6.08451E-12
5.000E-00	1.23096E-07	1.21465E-09	-6.79959E-12
1.000E&01	1.09362E-07	7.08595E-10	-3.60599E-12
2.500E&01	1.63258E-07	-1.09566E-09	7.04687E-12
5.000E&01	1.82057E-07	-8.96418E-10	4.84285E-12
7.500E&01	3.96999E-07	1.54426E-09	-1.06176E-11
1.000E&02	8.10838E-07	3.18183E-09	-2.04827E-11
1.250E&02	4.33368E-07	2.08941E-09	-1.30227E-11
1.500E&02	7.05810E-07	-2.27889E-09	1.49059E-11
2.000E&02	1.78431E-05	-1.69601E-08	1.07263E-10
2.500E&02	3.46555E-05	-2.42949E-08	1.52640E-10
3.000E&02	2.82461E-07	3.37858E-10	-2.13950E-12
3.500E&02	3.70091E-04	8.07119E-08	-5.04345E-10
4.000E&02	2.99630E-03	2.30754E-07	-1.43967E-09
4.500E&02	1.11087E-02	4.45606E-07	-2.77696E-09
5.000E&02	2.67408E-02	6.92806E-07	-4.31369E-09
6.000E&02	5.15184E-02	9.64364E-07	-5.99689E-09
7.000E&02	4.85980E-04	-9.38379E-08	5.83018E-10
8.000E&02	1.17009E-00	-4.61055E-06	2.86270E-08
9.000E&02	1.40316E&01	-1.59817E-05	9.91819E-08
1.000E&03	8.41587E&01	-3.91696E-05	2.42990E-07

PRESSURE, ATM.	S2DP	S2EP
1.000E-00	1.14606E-14	-9.16874E-18
2.000E-00	1.56123E-14	-1.24733E-17
5.000E-00	1.72677E-14	-1.37323E-17
1.000E&01	8.77089E-15	-6.83735E-18
2.500E&01	-1.88295E-14	1.53009E-17
5.000E&01	-1.19175E-14	9.31580E-18
7.500E&01	2.93606E-14	-2.42399E-17
1.000E&02	5.50824E-14	-4.49204E-17
1.250E&02	3.44157E-14	-2.78299E-17
1.500E&02	-4.06844E-14	3.34467E-17
2.000E&02	-2.87158E-13	2.33853E-16
2.500E&02	-4.07250E-13	3.31113E-16
3.000E&02	5.80262E-15	-4.77007E-18
3.500E&02	1.34232E-12	-1.09018E-15
4.000E&02	3.82873E-12	-3.10839E-15
4.500E&02	7.38116E-12	-5.99093E-15
5.000E&02	1.14610E-11	-9.30057E-15
6.000E&02	1.59236E-11	-1.29184E-14
7.000E&02	-1.54747E-12	1.25518E-15
8.000E&02	-7.59606E-11	6.16049E-14
9.000E&02	-2.63115E-10	2.13367E-13
1.000E&03	-6.44503E-10	5.22602E-13

TABLE 2.- VARIANCES AND COVARIANCES AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-20

PRESSURE, ATM.	S2P	S2BP	S2CP
1.000E-00	1.61045E-08	3.41525E-10	-1.99767E-12
2.000E-00	3.22630E-08	4.69174E-10	-2.72408E-12
5.000E-00	5.31196E-08	5.34119E-10	-3.02470E-12
1.000E&01	4.68725E-08	3.05499E-10	-1.56671E-12
2.500E&01	7.12465E-08	-4.91897E-10	3.19421E-12
5.000E&01	7.78408E-08	-3.75871E-10	2.03319E-12
7.500E&01	1.78073E-07	7.16142E-10	-4.95872E-12
1.000E&02	3.49339E-07	1.40752E-09	-9.15831E-12
1.250E&02	1.71580E-07	8.46731E-10	-5.32306E-12
1.500E&02	3.65546E-07	-1.18202E-09	7.79022E-12
2.000E&02	8.21227E-06	-7.74051E-09	4.95304E-11
2.500E&02	1.43551E-05	-1.05037E-08	6.67814E-11
3.000E&02	5.44727E-07	1.80179E-09	-1.14292E-11
3.500E&02	1.99443E-04	3.97951E-08	-2.51664E-10
4.000E&02	1.48880E-03	1.09224E-07	-6.89682E-10
4.500E&02	5.30512E-03	2.06768E-07	-1.30413E-09
5.000E&02	1.23309E-02	3.15880E-07	-1.99060E-09
6.000E&02	2.08940E-02	4.12336E-07	-2.59519E-09
7.000E&02	2.66931E-03	-1.47651E-07	9.28495E-10
8.000E&02	6.77468E-01	-2.35531E-06	1.48017E-08
9.000E&02	7.25997E-00	-7.71778E-06	4.84781E-08
1.000E&03	4.05973E&01	-1.82642E-05	1.14679E-07

PRESSURE, ATM.	S2DP	S2EP
1.000E-00	5.20459E-15	-4.21821E-18
2.000E-00	7.07534E-15	-5.72657E-18
5.000E-00	7.77392E-15	-6.26241E-18
1.000E&01	3.84918E-15	-3.03662E-18
2.500E&01	-8.63274E-15	7.10428E-18
5.000E&01	-5.03325E-15	3.97297E-18
7.500E&01	1.38541E-14	-1.15782E-17
1.000E&02	2.49169E-14	-2.05807E-17
1.250E&02	1.42101E-14	-1.16285E-17
1.500E&02	-2.14681E-14	1.78574E-17
2.000E&02	-1.34210E-13	1.10720E-16
2.500E&02	-1.80356E-13	1.48554E-16
3.000E&02	3.08695E-14	-2.54359E-17
3.500E&02	6.78043E-13	-5.57890E-16
4.000E&02	1.85675E-12	-1.52717E-15
4.500E&02	3.50909E-12	-2.88548E-15
5.000E&02	5.35401E-12	-4.40171E-15
6.000E&02	6.97604E-12	-5.73367E-15
7.000E&02	-2.49485E-12	2.05016E-15
8.000E&02	-3.97603E-11	3.26689E-14
9.000E&02	-1.30192E-10	1.06961E-13
1.000E&03	-3.07928E-10	2.52962E-13

TABLE 2. - VARIANCES AND COVARIANCES AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-21

PRESSURE, ATM.	S2P	S2BP	S2CP
1.000E-00	4.02210E-09	7.45042E-11	-3.92939E-13
2.000E-00	8.27494E-09	1.04021E-10	-5.44892E-13
5.000E-00	1.45178E-08	1.24364E-10	-6.37351E-13
1.000E&01	1.36229E-08	8.26147E-11	-3.93646E-13
2.500E&01	1.76939E-08	-9.39951E-11	5.63629E-13
5.000E&01	2.34368E-08	-1.18887E-10	6.17321E-13
7.500E&01	3.48948E-08	9.38881E-11	-6.26045E-13
1.000E&02	8.96436E-08	2.95215E-10	-1.75364E-12
1.250E&02	8.33695E-08	3.01931E-10	-1.74349E-12
1.500E&02	3.08825E-08	2.95720E-11	-1.35110E-13
2.000E&02	1.14044E-06	-1.22515E-09	7.09335E-12
2.500E&02	4.27701E-06	-2.47795E-09	1.42261E-11
3.000E&02	2.54365E-06	-1.93307E-09	1.10524E-11
3.500E&02	4.05166E-06	2.44763E-09	-1.39644E-11
4.000E&02	1.01256E-04	1.23676E-08	-7.04311E-11
4.500E&02	5.38164E-04	2.86147E-08	-1.62746E-10
5.000E&02	1.66676E-03	5.04802E-08	-2.86826E-10
6.000E&02	6.15703E-03	9.73363E-08	-5.52284E-10
7.000E&02	5.99932E-03	9.62824E-08	-5.45777E-10
8.000E&02	2.76255E-03	-6.54317E-08	3.70638E-10
9.000E&02	2.04278E-01	-5.63271E-07	3.18893E-09
1.000E&03	1.70318E-00	-1.62780E-06	9.21178E-09

PRESSURE, ATM.	S2DP	S2EP
1.000E-00	9.21658E-16	-6.67794E-19
2.000E-00	1.27450E-15	-9.22318E-19
5.000E-00	1.47727E-15	-1.06476E-18
1.000E&01	8.83720E-16	-6.27784E-19
2.500E&01	-1.38226E-15	1.02013E-18
5.000E&01	-1.42442E-15	1.02293E-18
7.500E&01	1.61344E-15	-1.21739E-18
1.000E&02	4.31756E-15	-3.19497E-18
1.250E&02	4.23539E-15	-3.11492E-18
1.500E&02	2.73562E-16	-1.80959E-19
2.000E&02	-1.73296E-14	1.27878E-17
2.500E&02	-3.46031E-14	2.54811E-17
3.000E&02	-2.68272E-14	1.97352E-17
3.500E&02	3.38732E-14	-2.49137E-17
4.000E&02	1.70670E-13	-1.25464E-16
4.500E&02	3.94125E-13	-2.89647E-16
5.000E&02	6.94293E-13	-5.10135E-16
6.000E&02	1.33598E-12	-9.81331E-16
7.000E&02	1.31966E-12	-9.69143E-16
8.000E&02	-8.95896E-13	6.57838E-16
9.000E&02	-7.70631E-12	5.65795E-15
1.000E&03	-2.22567E-11	1.63394E-14

TABLE 2.- VARIANCES AND COVARIANCES AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-22

PRESSURE, ATM.	S2P	S2BP	S2CP
1.000E-00	7.37969E-09	1.89329E-10	-1.27738E-12
2.000E-00	1.42022E-08	2.53709E-10	-1.69748E-12
5.000E-00	2.12449E-08	2.66816E-10	-1.73155E-12
1.000E&01	1.75023E-08	1.12429E-10	-6.12409E-13
2.500E&01	3.23018E-08	-3.02823E-10	2.21379E-12
5.000E&01	3.10952E-08	-4.97760E-11	1.23781E-13
7.500E&01	1.06598E-07	5.73779E-10	-4.41361E-12
1.000E&02	1.07249E-07	6.38224E-10	-4.71505E-12
1.250E&02	6.82544E-08	-2.51670E-10	1.98454E-12
1.500E&02	8.66672E-07	-1.95374E-09	1.45609E-11
2.000E&02	5.20348E-06	-5.15703E-09	3.79511E-11
2.500E&02	3.87823E-07	-1.36070E-09	9.96053E-12
3.000E&02	5.86994E-05	1.77278E-08	-1.29511E-10
3.500E&02	5.92837E-04	5.66539E-08	-4.13138E-10
4.000E&02	2.29309E-03	1.11782E-07	-8.14117E-10
4.500E&02	5.08975E-03	1.66910E-07	-1.21446E-09
5.000E&02	6.50180E-03	1.88962E-07	-1.37390E-09
6.000E&02	2.10148E-03	-1.07679E-07	7.82065E-10
7.000E&02	4.24702E-01	-1.53314E-06	1.11267E-08
8.000E&02	5.15938E-00	-5.34958E-06	3.88030E-08
9.000E&02	3.23052E&01	-1.33973E-05	9.71361E-08
1.000E&03	1.41964E&02	-2.81030E-05	2.03690E-07

PRESSURE, ATM.	S2DP	S2EP
1.000E-00	3.84623E-15	-3.63386E-18
2.000E-00	5.09313E-15	-4.80425E-18
5.000E-00	5.12769E-15	-4.80812E-18
1.000E&01	1.66340E-15	-1.49557E-18
2.500E&01	-6.85475E-15	6.55208E-18
5.000E&01	-3.70908E-17	-1.18332E-19
7.500E&01	1.40408E-14	-1.35942E-17
1.000E&02	1.47132E-14	-1.41172E-17
1.250E&02	-6.46271E-15	6.33759E-18
1.500E&02	-4.58624E-14	4.42385E-17
2.000E&02	-1.18718E-13	1.14132E-16
2.500E&02	-3.10568E-14	2.98054E-17
3.000E&02	4.03745E-13	-3.87534E-16
3.500E&02	1.28675E-12	-1.23453E-15
4.000E&02	2.53407E-12	-2.43052E-15
4.500E&02	3.77849E-12	-3.62333E-15
5.000E&02	4.27305E-12	-4.09690E-15
6.000E&02	-2.43111E-12	2.33034E-15
7.000E&02	-3.45763E-11	3.31376E-14
8.000E&02	-1.20549E-10	1.15519E-13
9.000E&02	-3.01712E-10	2.89098E-13
1.000E&03	-6.32579E-10	6.06087E-13

TABLE 3. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-1

PRESSURE, ATM.	Z	SZ
1.000E-00	1.0005441230E-00	5.34380E-06
2.000E-00	1.0010880011E-00	1.05525E-05
5.000E-00	1.0027181764E-00	2.56812E-05
1.000E&01	1.0054303321E-00	4.95004E-05
2.500E&01	1.0135319112E-00	1.11887E-04
5.000E&01	1.0269253741E-00	1.90138E-04
7.500E&01	1.0401944952E-00	2.42626E-04
1.000E&02	1.0533521534E-00	2.75931E-04
1.250E&02	1.0664100006E-00	2.96018E-04
1.500E&02	1.0793784613E-00	3.08223E-04
2.000E&02	1.1050827846E-00	3.26976E-04
2.500E&02	1.1305239726E-00	3.61487E-04
3.000E&02	1.1557412382E-00	4.31015E-04
3.500E&02	1.1807541568E-00	5.43788E-04
4.000E&02	1.2055626671E-00	6.93274E-04
4.500E&02	1.2301470707E-00	8.55504E-04
5.000E&02	1.2544680321E-00	9.88257E-04
6.000E&02	1.3020641022E-00	9.05062E-04
7.000E&02	1.3476434543E-00	3.71306E-04
8.000E&02	1.3901844734E-00	3.54972E-03
9.000E&02	1.4283513524E-00	9.88219E-03
1.000E&03	1.4604940925E-00	2.01621E-02

TABLE 3.- COMPRESSIBILITY FACTORS AND STANDARD ERRORS AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-2

PRESSURE, ATM.	Z	SZ
1.000E-00	1.0005458134E-00	3.30322E-06
2.000E-00	1.0010913669E-00	6.52280E-06
5.000E-00	1.0027264785E-00	1.58831E-05
1.000E&01	1.0054465665E-00	3.06577E-05
2.500E&01	1.0135698161E-00	6.96401E-05
5.000E&01	1.0269928599E-00	1.19387E-04
7.500E&01	1.0402843668E-00	1.53676E-04
1.000E&02	1.0534583147E-00	1.76170E-04
1.250E&02	1.0665274245E-00	1.90217E-04
1.500E&02	1.0795031599E-00	1.98852E-04
2.000E&02	1.1052140757E-00	2.10327E-04
2.500E&02	1.1306576259E-00	2.28009E-04
3.000E&02	1.1558802588E-00	2.64082E-04
3.500E&02	1.1809083067E-00	3.25415E-04
4.000E&02	1.2057479860E-00	4.11864E-04
4.500E&02	1.2303853971E-00	5.14488E-04
5.000E&02	1.2547865248E-00	6.14831E-04
6.000E&02	1.3026432890E-00	6.86252E-04
7.000E&02	1.3486438380E-00	2.99358E-04
8.000E&02	1.3917918773E-00	1.11127E-03
9.000E&02	1.4307692582E-00	3.97524E-03
1.000E&03	1.4639359780E-00	8.81338E-03

TABLE 3. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-3

PRESSURE, ATM.	Z	SZ
1.000E-00	1.0005480176E-00	6.09367E-06
2.000E-00	1.0010957628E-00	1.20326E-05
5.000E-00	1.0027373749E-00	2.93025E-05
1.000E&01	1.0054680523E-00	5.65773E-05
2.500E&01	1.0136213029E-00	1.28664E-04
5.000E&01	1.0270888868E-00	2.21030E-04
7.500E&01	1.0404188541E-00	2.85096E-04
1.000E&02	1.0536259995E-00	3.27451E-04
1.250E&02	1.0667238108E-00	3.54124E-04
1.500E&02	1.0797244683E-00	3.70596E-04
2.000E&02	1.1054765061E-00	3.91894E-04
2.500E&02	1.1309534085E-00	4.23123E-04
3.000E&02	1.1562055541E-00	4.86797E-04
3.500E&02	1.1812624041E-00	5.96167E-04
4.000E&02	1.2061325022E-00	7.52380E-04
4.500E&02	1.2308034752E-00	9.41190E-04
5.000E&02	1.2552420324E-00	1.13151E-03
6.000E&02	1.3031841506E-00	1.30612E-03
7.000E&02	1.3492741864E-00	6.99562E-04
8.000E&02	1.3924927933E-00	1.65100E-03
9.000E&02	1.4314859485E-00	6.51432E-03
1.000E&03	1.4645649527E-00	1.48057E-02

TABLE 3. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-4

PRESSURE, ATM.	Z	SZ
1.000E-00	1.0005415168E-00	1.31929E-06
2.000E-00	1.0010828306E-00	2.60529E-06
5.000E-00	1.0027055597E-00	6.34545E-06
1.000E&01	1.0054061044E-00	1.22540E-05
2.500E&01	1.0134784170E-00	2.78806E-05
5.000E&01	1.0268389808E-00	4.79334E-05
7.500E&01	1.0400905657E-00	6.18752E-05
1.000E&02	1.0532413898E-00	7.11194E-05
1.250E&02	1.0662990151E-00	7.69591E-05
1.500E&02	1.0792703477E-00	8.05715E-05
2.000E&02	1.1049784770E-00	8.51928E-05
2.500E&02	1.1304079012E-00	9.18352E-05
3.000E&02	1.1555902456E-00	1.05374E-04
3.500E&02	1.1805466365E-00	1.28718E-04
4.000E&02	1.2052877017E-00	1.62223E-04
4.500E&02	1.2298135705E-00	2.02994E-04
5.000E&02	1.2541138734E-00	2.44583E-04
6.000E&02	1.3019438106E-00	2.86132E-04
7.000E&02	1.3484845855E-00	1.63943E-04
8.000E&02	1.3932752918E-00	3.32926E-04
9.000E&02	1.4356870458E-00	1.40004E-03
1.000E&03	1.4749229853E-00	3.31311E-03

TABLE 3. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-5

PRESSURE, ATM.	Z	SZ
1.000E-00	1.0005465622E-00	6.39415E-06
2.000E-00	1.0010928600E-00	1.26262E-05
5.000E-00	1.0027301773E-00	3.07474E-05
1.000E&01	1.0054538519E-00	5.93619E-05
2.500E&01	1.0135872054E-00	1.34948E-04
5.000E&01	1.0270250061E-00	2.31676E-04
7.500E&01	1.0403288556E-00	2.98634E-04
1.000E&02	1.0535129533E-00	3.42794E-04
1.250E&02	1.0665902449E-00	3.70528E-04
1.500E&02	1.0795724220E-00	3.87629E-04
2.000E&02	1.1052919292E-00	4.09921E-04
2.500E&02	1.1307399290E-00	4.43132E-04
3.000E&02	1.1559648120E-00	5.10875E-04
3.500E&02	1.1809949057E-00	6.26876E-04
4.000E&02	1.2058384744E-00	7.91887E-04
4.500E&02	1.2304837190E-00	9.90246E-04
5.000E&02	1.2548987774E-00	1.18840E-03
6.000E&02	1.3028105705E-00	1.35826E-03
7.000E&02	1.3489176917E-00	6.86793E-04
8.000E&02	1.3922429671E-00	1.86282E-03
9.000E&02	1.4314882114E-00	7.11878E-03
1.000E&03	1.4650342277E-00	1.60789E-02

TABLE 3. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-6

PRESSURE, ATM.	Z	SZ
1.000E-00	1.0005475330E-00	5.08033E-06
2.000E-00	1.0010947798E-00	1.00317E-05
5.000E-00	1.0027348156E-00	2.44303E-05
1.000E&01	1.0054626053E-00	4.71726E-05
2.500E&01	1.0136054333E-00	1.07294E-04
5.000E&01	1.0270509833E-00	1.84375E-04
7.500E&01	1.0403551063E-00	2.37886E-04
1.000E&02	1.0535346995E-00	2.73301E-04
1.250E&02	1.0666051012E-00	2.95629E-04
1.500E&02	1.0795800906E-00	3.09427E-04
2.000E&02	1.1052911554E-00	3.27194E-04
2.500E&02	1.1307469495E-00	3.53049E-04
3.000E&02	1.1560015850E-00	4.05769E-04
3.500E&02	1.1810842308E-00	4.96493E-04
4.000E&02	1.2059991127E-00	6.26369E-04
4.500E&02	1.2307255129E-00	7.83784E-04
5.000E&02	1.2552177704E-00	9.43129E-04
6.000E&02	1.3031924975E-00	1.09350E-03
7.000E&02	1.3490591403E-00	6.01505E-04
8.000E&02	1.3915544526E-00	1.31331E-03
9.000E&02	1.4290160956E-00	5.23655E-03
1.000E&03	1.4593826377E-00	1.18132E-02

TABLE 3. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-7

PRESSURE, ATM.	Z	SZ
1.000E-00	1.0005385943E-00	2.54855E-06
2.000E-00	1.0010770065E-00	5.03297E-06
5.000E-00	1.0026911545E-00	1.22583E-05
1.000E&01	1.0053778030E-00	2.36707E-05
2.500E&01	1.0134113247E-00	5.38365E-05
5.000E&01	1.0267159977E-00	9.24941E-05
7.500E&01	1.0399211037E-00	1.19314E-04
1.000E&02	1.0530332113E-00	1.37052E-04
1.250E&02	1.0660583728E-00	1.48225E-04
1.500E&02	1.0790021242E-00	1.55124E-04
2.000E&02	1.1046649594E-00	1.64023E-04
2.500E&02	1.1300556792E-00	1.77033E-04
3.000E&02	1.1551999857E-00	2.03571E-04
3.500E&02	1.1801153201E-00	2.49180E-04
4.000E&02	1.2048108634E-00	3.14360E-04
4.500E&02	1.2292875359E-00	3.93221E-04
5.000E&02	1.2535379974E-00	4.72925E-04
6.000E&02	1.3012896246E-00	5.47725E-04
7.000E&02	1.3478418132E-00	2.96971E-04
8.000E&02	1.3928384635E-00	6.98992E-04
9.000E&02	1.4357913073E-00	2.83661E-03
1.000E&03	1.4760799082E-00	6.68825E-03

TABLE 3. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-8

PRESSURE, ATM.	Z	SZ
1.000E-00	1.0005413361E-00	2.22003E-06
2.000E-00	1.0010824668E-00	4.38405E-06
5.000E-00	1.0027046326E-00	1.06772E-05
1.000E&01	1.0054041934E-00	2.06163E-05
2.500E&01	1.0134732323E-00	4.68819E-05
5.000E&01	1.0268273873E-00	8.05252E-05
7.500E&01	1.0400715763E-00	1.03848E-04
1.000E&02	1.0532142368E-00	1.19259E-04
1.250E&02	1.0662631319E-00	1.28957E-04
1.500E&02	1.0792253507E-00	1.34942E-04
2.000E&02	1.1049147452E-00	1.42690E-04
2.500E&02	1.1303256502E-00	1.54093E-04
3.000E&02	1.1554905094E-00	1.77350E-04
3.500E&02	1.1804309805E-00	2.17265E-04
4.000E&02	1.2051579348E-00	2.74211E-04
4.500E&02	1.2296714577E-00	3.42956E-04
5.000E&02	1.2539608483E-00	4.12167E-04
6.000E&02	1.3017704979E-00	4.75282E-04
7.000E&02	1.3482855531E-00	2.51648E-04
8.000E&02	1.3930321045E-00	6.25117E-04
9.000E&02	1.4353636642E-00	2.49060E-03
1.000E&03	1.4744611654E-00	5.81355E-03

TABLE 3. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-9

PRESSURE, ATM.	Z	SZ
1.000E-00	1.0005323282E-00	1.39641E-05
2.000E-00	1.0010645110E-00	2.75791E-05
5.000E-00	1.0026601894E-00	6.71632E-05
1.000E&01	1.0053167757E-00	1.29629E-04
2.500E&01	1.0132653518E-00	2.94281E-04
5.000E&01	1.0264448844E-00	5.03889E-04
7.500E&01	1.0395435816E-00	6.47817E-04
1.000E&02	1.0525659990E-00	7.41804E-04
1.250E&02	1.0655162646E-00	8.00199E-04
1.500E&02	1.0783980782E-00	8.35982E-04
2.000E&02	1.1039690096E-00	8.84272E-04
2.500E&02	1.1292998339E-00	9.60767E-04
3.000E&02	1.1544047450E-00	1.11692E-03
3.500E&02	1.1792910900E-00	1.38092E-03
4.000E&02	1.2039593692E-00	1.75015E-03
4.500E&02	1.2284032359E-00	2.18388E-03
5.000E&02	1.2526094967E-00	2.60055E-03
6.000E&02	1.3002221927E-00	2.84748E-03
7.000E&02	1.3465549733E-00	1.07471E-03
8.000E&02	1.3912558049E-00	5.35868E-03
9.000E&02	1.4338631048E-00	1.87076E-02
1.000E&03	1.4738057409E-00	4.23667E-02

TABLE 3. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-10

PRESSURE, ATM.	Z	SZ
1.000E-00	1.0005306016E-00	6.20938E-06
2.000E-00	1.0010611140E-00	1.22636E-05
5.000E-00	1.0026521124E-00	2.98746E-05
1.000E&01	1.0053019686E-00	5.77002E-05
2.500E&01	1.0132377334E-00	1.31306E-04
5.000E&01	1.0264164951E-00	2.25797E-04
7.500E&01	1.0395333912E-00	2.91536E-04
1.000E&02	1.0525859152E-00	3.35161E-04
1.250E&02	1.0655719485E-00	3.62743E-04
1.500E&02	1.0784897598E-00	3.79808E-04
2.000E&02	1.1041157303E-00	4.01547E-04
2.500E&02	1.1294577294E-00	4.32602E-04
3.000E&02	1.1545158619E-00	4.95916E-04
3.500E&02	1.1792964338E-00	6.05197E-04
4.000E&02	1.2038119530E-00	7.62221E-04
4.500E&02	1.2280811290E-00	9.53672E-04
5.000E&02	1.2521288729E-00	1.14982E-03
6.000E&02	1.2996907173E-00	1.35250E-03
7.000E&02	1.3468208082E-00	7.92041E-04
8.000E&02	1.3939416939E-00	1.57573E-03
9.000E&02	1.4415751490E-00	6.92941E-03
1.000E&03	1.4903421747E-00	1.73235E-02

TABLE 3. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-11

PRESSURE, ATM.	Z	SZ
1.000E-00	1.0005390337E-00	3.10480E-06
2.000E-00	1.0010778833E-00	6.13143E-06
5.000E-00	1.0026933331E-00	1.49338E-05
1.000E&01	1.0053821148E-00	2.88382E-05
2.500E&01	1.0134217618E-00	6.55981E-05
5.000E&01	1.0267357206E-00	1.12728E-04
7.500E&01	1.0399489511E-00	1.45452E-04
1.000E&02	1.0530680246E-00	1.67113E-04
1.250E&02	1.0660990090E-00	1.80771E-04
1.500E&02	1.0790474687E-00	1.89210E-04
2.000E&02	1.1047165550E-00	2.00061E-04
2.500E&02	1.1301097310E-00	2.15830E-04
3.000E&02	1.1552533894E-00	2.47989E-04
3.500E&02	1.1801658684E-00	3.03322E-04
4.000E&02	1.2048574516E-00	3.82519E-04
4.500E&02	1.2293303677E-00	4.78538E-04
5.000E&02	1.2535787911E-00	5.75917E-04
6.000E&02	1.3013385835E-00	6.69532E-04
7.000E&02	1.3479291298E-00	3.70522E-04
8.000E&02	1.3930138571E-00	8.28978E-04
9.000E&02	1.4361273182E-00	3.41228E-03
1.000E&03	1.4766751916E-00	8.08109E-03

TABLE 3. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-12

PRESSURE, ATM.	Z	SZ
1.000E-00	1.0005352412E-00	6.14980E-06
2.000E-00	1.0010703344E-00	1.21453E-05
5.000E-00	1.0026747282E-00	2.95816E-05
1.000E&01	1.0053457805E-00	5.71183E-05
2.500E&01	1.0133371895E-00	1.29869E-04
5.000E&01	1.0265855106E-00	2.22993E-04
7.500E&01	1.0397485822E-00	2.87487E-04
1.000E&02	1.0528298113E-00	3.30048E-04
1.250E&02	1.0658323924E-00	3.56794E-04
1.500E&02	1.0787593078E-00	3.73284E-04
2.000E&02	1.1043970089E-00	3.94703E-04
2.500E&02	1.1297625271E-00	4.26471E-04
3.000E&02	1.1548720782E-00	4.91303E-04
3.500E&02	1.1797384812E-00	6.02406E-04
4.000E&02	1.2043711589E-00	7.60582E-04
4.500E&02	1.2287761373E-00	9.51020E-04
5.000E&02	1.2529560457E-00	1.14199E-03
6.000E&02	1.3006341878E-00	1.31153E-03
7.000E&02	1.3473586887E-00	6.76064E-04
8.000E&02	1.3930283068E-00	1.81640E-03
9.000E&02	1.4374874551E-00	7.21200E-03
1.000E&03	1.4805262009E-00	1.71197E-02

TABLE 3. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-13

PRESSURE, ATM.	Z	SZ
1.000E-00	1.0005709051E-00	4.87409E-06
2.000E-00	1.0011410480E-00	9.62158E-06
5.000E-00	1.0028469623E-00	2.34252E-05
1.000E&01	1.0056754629E-00	4.52325E-05
2.500E&01	1.0140574923E-00	1.02949E-04
5.000E&01	1.0277245037E-00	1.77154E-04
7.500E&01	1.0410834574E-00	2.28883E-04
1.000E&02	1.0542087691E-00	2.63288E-04
1.250E&02	1.0671668462E-00	2.85101E-04
1.500E&02	1.0800160886E-00	2.98629E-04
2.000E&02	1.1055816287E-00	3.15750E-04
2.500E&02	1.1312124292E-00	3.39762E-04
3.000E&02	1.1570874036E-00	3.88801E-04
3.500E&02	1.1832573392E-00	4.74241E-04
4.000E&02	1.2096448968E-00	5.98351E-04
4.500E&02	1.2360446110E-00	7.50975E-04
5.000E&02	1.2621228900E-00	9.07607E-04
6.000E&02	1.3113401430E-00	1.06414E-03
7.000E&02	1.3520653944E-00	6.49656E-04
8.000E&02	1.3770173611E-00	8.02251E-04
9.000E&02	1.3768647385E-00	3.09710E-03
1.000E&03	1.3402262003E-00	5.80046E-03

TABLE 3.- COMPRESSIBILITY FACTORS AND STANDARD ERRORS AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-14

PRESSURE, ATM.	Z	SZ
1.000E-00	1.0005420791E-00	2.97055E-06
2.000E-00	1.0010839341E-00	5.86611E-06
5.000E-00	1.0027081621E-00	1.42862E-05
1.000E&01	1.0054108015E-00	2.75829E-05
2.500E&01	1.0134865934E-00	6.27103E-05
5.000E&01	1.0268449976E-00	1.07670E-04
7.500E&01	1.0400868192E-00	1.38802E-04
1.000E&02	1.0532227364E-00	1.59342E-04
1.250E&02	1.0662624987E-00	1.72247E-04
1.500E&02	1.0792149277E-00	1.80204E-04
2.000E&02	1.1048884283E-00	1.90556E-04
2.500E&02	1.1302952401E-00	2.05936E-04
3.000E&02	1.1554725100E-00	2.37316E-04
3.500E&02	1.1804425301E-00	2.91081E-04
4.000E&02	1.2052127379E-00	3.67611E-04
4.500E&02	1.2297757157E-00	4.59696E-04
5.000E&02	1.2541091912E-00	5.51867E-04
6.000E&02	1.3019242713E-00	6.32226E-04
7.000E&02	1.3481827020E-00	3.23286E-04
8.000E&02	1.3921715298E-00	8.63239E-04
9.000E&02	1.4329401233E-00	3.34605E-03
1.000E&03	1.4693001737E-00	7.67285E-03

TABLE 3. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-15

PRESSURE, ATM.	Z	SZ
1.000E-00	1.0005398444E-00	4.30909E-06
2.000E-00	1.0010794919E-00	8.50959E-06
5.000E-00	1.0026972585E-00	2.07268E-05
1.000E&01	1.0053896530E-00	4.00289E-05
2.500E&01	1.0134384066E-00	9.10889E-05
5.000E&01	1.0267625934E-00	1.56643E-04
7.500E&01	1.0399812556E-00	2.02256E-04
1.000E&02	1.0531024269E-00	2.32528E-04
1.250E&02	1.0661334798E-00	2.51670E-04
1.500E&02	1.0790811255E-00	2.63518E-04
2.000E&02	1.1047497333E-00	2.78619E-04
2.500E&02	1.1301487130E-00	3.00179E-04
3.000E&02	1.1553079460E-00	3.44124E-04
3.500E&02	1.1802467322E-00	4.20007E-04
4.000E&02	1.2049737904E-00	5.29113E-04
4.500E&02	1.2294872580E-00	6.62187E-04
5.000E&02	1.2537746911E-00	7.98433E-04
6.000E&02	1.3015687716E-00	9.37811E-04
7.000E&02	1.3480448544E-00	5.48818E-04
8.000E&02	1.3927224610E-00	1.05017E-03
9.000E&02	1.4349518116E-00	4.48897E-03
1.000E&03	1.4739138259E-00	1.06546E-02

TABLE 3. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-16

PRESSURE, ATM.	Z	SZ
1.000E-00	1.0005352655E-00	5.43547E-07
2.000E-00	1.0010703821E-00	1.07345E-06
5.000E-00	1.0026748410E-00	2.61474E-06
1.000E&01	1.0053459850E-00	5.04973E-06
2.500E&01	1.0133375512E-00	1.14894E-05
5.000E&01	1.0265857919E-00	1.97523E-05
7.500E&01	1.0397484423E-00	2.54964E-05
1.000E&02	1.0528290030E-00	2.93044E-05
1.250E&02	1.0658307547E-00	3.17094E-05
1.500E&02	1.0787567579E-00	3.31966E-05
2.000E&02	1.1043926625E-00	3.50980E-05
2.500E&02	1.1297568040E-00	3.78328E-05
3.000E&02	1.1548657513E-00	4.34095E-05
3.500E&02	1.1797325546E-00	5.30250E-05
4.000E&02	1.2043667457E-00	6.68229E-05
4.500E&02	1.2287743377E-00	8.36109E-05
5.000E&02	1.2529578253E-00	1.00739E-04
6.000E&02	1.3006448726E-00	1.17914E-04
7.000E&02	1.3473774737E-00	6.75629E-05
8.000E&02	1.3930489174E-00	1.39304E-04
9.000E&02	1.4374961962E-00	5.92214E-04
1.000E&03	1.4805000055E-00	1.42926E-03

TABLE 3.- COMPRESSIBILITY FACTORS AND STANDARD ERRORS AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-17

PRESSURE, ATM.	Z	SZ
1.000E-00	1.0005327412E-00	1.08661E-06
2.000E-00	1.0010653647E-00	2.14604E-06
5.000E-00	1.0026625288E-00	5.22716E-06
1.000E&01	1.0053221151E-00	1.00932E-05
2.500E&01	1.0132832365E-00	2.29491E-05
5.000E&01	1.0264931056E-00	3.94049E-05
7.500E&01	1.0396299230E-00	5.08013E-05
1.000E&02	1.0526940945E-00	5.83219E-05
1.250E&02	1.0656861160E-00	6.30479E-05
1.500E&02	1.0786065733E-00	6.59613E-05
2.000E&02	1.1042355892E-00	6.97445E-05
2.500E&02	1.1295876304E-00	7.53562E-05
3.000E&02	1.1546706260E-00	8.68093E-05
3.500E&02	1.1794939455E-00	1.06435E-04
4.000E&02	1.2040683997E-00	1.34372E-04
4.500E&02	1.2284062398E-00	1.68008E-04
5.000E&02	1.2525211580E-00	2.01751E-04
6.000E&02	1.3001442012E-00	2.31840E-04
7.000E&02	1.3470758823E-00	1.19585E-04
8.000E&02	1.3934776072E-00	3.24331E-04
9.000E&02	1.4395338343E-00	1.29954E-03
1.000E&03	1.4854520749E-00	3.13279E-03

TABLE 3. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-18

PRESSURE, ATM.	Z	SZ
1.000E-00	1.0005290301E-00	6.83985E-06
2.000E-00	1.0010579780E-00	1.35091E-05
5.000E-00	1.0026443266E-00	3.29084E-05
1.000E&01	1.0052865759E-00	6.35564E-05
2.500E&01	1.0132005730E-00	1.44599E-04
5.000E&01	1.0263464407E-00	2.48548E-04
7.500E&01	1.0394344493E-00	3.20771E-04
1.000E&02	1.0524618308E-00	3.68621E-04
1.250E&02	1.0654262035E-00	3.98820E-04
1.500E&02	1.0783255715E-00	4.17481E-04
2.000E&02	1.1039232403E-00	4.41373E-04
2.500E&02	1.1292465912E-00	4.75877E-04
3.000E&02	1.1542935547E-00	5.46269E-04
3.500E&02	1.1790682377E-00	6.67533E-04
4.000E&02	1.2035809233E-00	8.41326E-04
4.500E&02	1.2278480713E-00	1.05248E-03
5.000E&02	1.2518923177E-00	1.26759E-03
6.000E&02	1.2994335324E-00	1.48171E-03
7.000E&02	1.3465091846E-00	8.39571E-04
8.000E&02	1.3935227141E-00	1.82358E-03
9.000E&02	1.4409763834E-00	7.81465E-03
1.000E&03	1.4894712776E-00	1.93991E-02

TABLE 3. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-19

PRESSURE, ATM.	Z	SZ
1.000E-00	1.0005342299E-00	4.44173E-06
2.000E-00	1.0010683325E-00	8.77218E-06
5.000E-00	1.0026698762E-00	2.13653E-05
1.000E&01	1.0053365732E-00	4.12501E-05
2.500E&01	1.0133176668E-00	9.37589E-05
5.000E&01	1.0265566440E-00	1.60892E-04
7.500E&01	1.0397179553E-00	2.07300E-04
1.000E&02	1.0528026667E-00	2.37857E-04
1.250E&02	1.0658118861E-00	2.57012E-04
1.500E&02	1.0787467638E-00	2.68805E-04
2.000E&02	1.1043983059E-00	2.84247E-04
2.500E&02	1.1297673380E-00	3.07492E-04
3.000E&02	1.1548645794E-00	3.54937E-04
3.500E&02	1.1797014243E-00	4.35987E-04
4.000E&02	1.2042899412E-00	5.50911E-04
4.500E&02	1.2286428731E-00	6.88548E-04
5.000E&02	1.2527736378E-00	8.25405E-04
6.000E&02	1.3004257082E-00	9.39237E-04
7.000E&02	1.3473669837E-00	4.56689E-04
8.000E&02	1.3937290883E-00	1.41325E-03
9.000E&02	1.4396544381E-00	5.49077E-03
1.000E&03	1.4852962417E-00	1.31105E-02

TABLE 3. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-20

PRESSURE, ATM.	Z	SZ
1.000E-00	1.0005366244E-00	2.98091E-06
2.000E-00	1.0010730858E-00	5.88699E-06
5.000E-00	1.0026814947E-00	1.43360E-05
1.000E&01	1.0053589480E-00	2.76699E-05
2.500E&01	1.0133675098E-00	6.28263E-05
5.000E&01	1.0266384039E-00	1.07613E-04
7.500E&01	1.0398179184E-00	1.38401E-04
1.000E&02	1.0529109259E-00	1.58533E-04
1.250E&02	1.0659219363E-00	1.71060E-04
1.500E&02	1.0788550957E-00	1.78744E-04
2.000E&02	1.1045026312E-00	1.89069E-04
2.500E&02	1.1298794386E-00	2.05297E-04
3.000E&02	1.1550056124E-00	2.38412E-04
3.500E&02	1.1798954354E-00	2.94471E-04
4.000E&02	1.2045573785E-00	3.73027E-04
4.500E&02	1.2289941011E-00	4.65579E-04
5.000E&02	1.2532024505E-00	5.54985E-04
6.000E&02	1.3008923614E-00	6.11431E-04
7.000E&02	1.3474856563E-00	2.40600E-04
8.000E&02	1.3927478925E-00	1.11829E-03
9.000E&02	1.4363516392E-00	3.96754E-03
1.000E&03	1.4778764778E-00	9.07551E-03

TABLE 3. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-21

PRESSURE, ATM.	Z	SZ
1.000E-00	1.0005404813E-00	1.30277E-06
2.000E-00	1.0010807520E-00	2.57248E-06
5.000E-00	1.0027003066E-00	6.26976E-06
1.000E&01	1.0053954160E-00	1.21294E-05
2.500E&01	1.0134504365E-00	2.77728E-05
5.000E&01	1.0267795251E-00	4.82942E-05
7.500E&01	1.0399973997E-00	6.30574E-05
1.000E&02	1.0531134477E-00	7.32632E-05
1.250E&02	1.0661363096E-00	8.00189E-05
1.500E&02	1.0790738794E-00	8.43475E-05
2.000E&02	1.1047209851E-00	8.93562E-05
2.500E&02	1.1301029826E-00	9.45710E-05
3.000E&02	1.1552561429E-00	1.04735E-04
3.500E&02	1.1802047901E-00	1.23160E-04
4.000E&02	1.2049613014E-00	1.51470E-04
4.500E&02	1.2295261070E-00	1.89020E-04
5.000E&02	1.2538876902E-00	2.32475E-04
6.000E&02	1.3018953885E-00	3.09522E-04
7.000E&02	1.3486533248E-00	2.98544E-04
8.000E&02	1.3936392773E-00	8.59261E-05
9.000E&02	1.4361398734E-00	5.65751E-04
1.000E&03	1.4752505902E-00	1.76206E-03

TABLE 3. - COMPRESSIBILITY FACTORS AND STANDARD ERRORS AT EVEN INCREMENTS OF PRESSURE

RUN NO. HE-0-22

PRESSURE, ATM.

Z

SZ

1.000E-00	1.0005353011E-00	2.43987E-06
2.000E-00	1.0010704519E-00	4.81818E-06
5.000E-00	1.0026750047E-00	1.17134E-05
1.000E&01	1.0053462777E-00	2.25195E-05
2.500E&01	1.0133380532E-00	5.04482E-05
5.000E&01	1.0265862178E-00	8.43865E-05
7.500E&01	1.0397485267E-00	1.06032E-04
1.000E&02	1.0528287332E-00	1.18951E-04
1.250E&02	1.0658303103E-00	1.26316E-04
1.500E&02	1.0787564507E-00	1.30897E-04
2.000E&02	1.1043937928E-00	1.40688E-04
2.500E&02	1.1297607003E-00	1.62265E-04
3.000E&02	1.1548726321E-00	2.03301E-04
3.500E&02	1.1797405655E-00	2.63706E-04
4.000E&02	1.2043709959E-00	3.33514E-04
4.500E&02	1.2287659370E-00	3.92057E-04
5.000E&02	1.2529229207E-00	4.07741E-04
6.000E&02	1.3004907344E-00	1.42528E-04
7.000E&02	1.3469650565E-00	1.03279E-03
8.000E&02	1.3921647978E-00	3.71918E-03
9.000E&02	1.4358371609E-00	8.82922E-03
1.000E&03	1.4776576398E-00	1.73711E-02

Average $\bar{X} = 1.994121 \pm 0.00043$

Average standard error of $\bar{X} = 1.9 \times 10^{-5}$

Standard error of a single $X = \pm 0.000719$

1/ The value of \bar{X} for this run was omitted from the calculations.

TABLE 4. - Compressibility apparatus zero-pressure volume ratio, N

Run No.	N	Deviation from average N
HE-0-1	1.993908 \pm 0.000138	-0.000213
HE-0-2	1.993847 \pm 0.000090	-0.000274
HE-0-3	1.993735 \pm 0.000167	-0.000386
HE-0-4	1.993939 \pm 0.000036	-0.000182
HE-0-5	1.993843 \pm 0.000175	-0.000278
HE-0-6	1.993826 \pm 0.000140	-0.000295
HE-0-7	1.994111 \pm 0.000070	-0.000010
HE-0-8	1.993976 \pm 0.000061	-0.000145
HE-0-9	1.994479 \pm 0.000377	+0.000358
HE-0-10	1.994369 \pm 0.000172	+0.000248
HE-0-11	1.994105 \pm 0.000086	-0.000016
HE-0-12	1.994245 \pm 0.000169	+0.000124
<u>1</u> /HE-0-13	1.993476 \pm 0.000135	-0.000645
HE-0-14	1.994029 \pm 0.000081	-0.000092
HE-0-15	1.994112 \pm 0.000119	-0.000009
HE-0-16	1.994264 \pm 0.000015	+0.000143
HE-0-17	1.994338 \pm 0.000030	+0.000217
HE-0-18	1.994478 \pm 0.000189	+0.000357
HE-0-19	1.994282 \pm 0.000121	+0.000161
HE-0-20	1.994241 \pm 0.000081	+0.000120
HE-0-21	1.994127 \pm 0.000039	+0.000006
HE-0-22	1.994282 \pm 0.000058	+0.000161

Average N = 1.994121 \pm 0.000048Average standard error of N = \pm 0.000115Standard error of a single N = \pm 0.0002191/ The value of N for this run was omitted from the calculations.

TABLE 4. - Compressibility apparatus zero-pressure volume ratio, V_0

Run No.	V_0	Deviation from average V_0
HE-0-1	1.99398 ± 0.00018	-0.00013
HE-0-2	1.99387 ± 0.00090	-0.00037
HE-0-3	1.99375 ± 0.00016	-0.00038
HE-0-4	1.99393 ± 0.00036	-0.00018
HE-0-5	1.99387 ± 0.00017	-0.00027
HE-0-6	1.99382 ± 0.00040	-0.00027
HE-0-7	1.99411 ± 0.00030	-0.00010
HE-0-8	1.99397 ± 0.00061	-0.00043
HE-0-9	1.99439 ± 0.00037	+0.00028
HE-0-10	1.99468 ± 0.00017	+0.00048
HE-0-11	1.99410 ± 0.00088	-0.00016
HE-0-12	1.99427 ± 0.00089	+0.00024
HE-0-13	1.99373 ± 0.00033	-0.00042
HE-0-14	1.99402 ± 0.00081	-0.00032
HE-0-15	1.99412 ± 0.00019	-0.00009
HE-0-16	1.99426 ± 0.00013	+0.00013
HE-0-17	1.99438 ± 0.00030	+0.00017
HE-0-18	1.99478 ± 0.00018	+0.00037
HE-0-19	1.99485 ± 0.00017	+0.00016
HE-0-20	1.99434 ± 0.00081	+0.00020
HE-0-21	1.99412 ± 0.00039	+0.00009
HE-0-22	1.99481 ± 0.00028	+0.00016

Average $V_0 = 1.99411 \pm 0.00048$
Average standard error of $V_0 = \pm 0.00015$
Standard error of a single $V_0 = \pm 0.00019$

1. The value of V_0 for this run was omitted from the calculations.

TABLE 5. - Values for the constant B of equation (3) for helium
at 0° C

Run No.	$B \times 10^4, \text{ atm}^{-1}$	(Deviation from average B) $\times 10^4, \text{ atm}^{-1}$
HE-0-1	5.44246 ± 0.05271	+0.05281
HE-0-2	5.45944 ± 0.03252	+0.06979
HE-0-3	5.48154 ± 0.05996	+0.09189
HE-0-4	5.41619 ± 0.01298	+0.02654
HE-0-5	5.46695 ± 0.06293	+0.07730
HE-0-6	5.47677 ± 0.04998	+0.08712
HE-0-7	5.38686 ± 0.02508	-0.00279
HE-0-8	5.41439 ± 0.02185	+0.02474
HE-0-9	5.32401 ± 0.13758	-0.06564
HE-0-10	5.30646 ± 0.06112	-0.08319
HE-0-11	5.39126 ± 0.03056	+0.00161
HE-0-12	5.35315 ± 0.06055	-0.03650
<u>1/</u> HE-0-13	5.71288 ± 0.04790	+0.32323
HE-0-14	5.42192 ± 0.02924	+0.03227
HE-0-15	5.39943 ± 0.04240	+0.00978
HE-0-16	5.35340 ± 0.00535	-0.03625
HE-0-17	5.32800 ± 0.01070	-0.06165
HE-0-18	5.29071 ± 0.06734	-0.09894
HE-0-19	5.34294 ± 0.04374	-0.04671
HE-0-20	5.36706 ± 0.02936	-0.02259
HE-0-21	5.40587 ± 0.01278	+0.01622
HE-0-22	5.35376 ± 0.02415	-0.03589

Average B = $5.38965 \times 10^{-4} \pm 0.01233 \times 10^{-4} \text{ atm}^{-1}$

Average standard error of B = $\pm 0.04157 \times 10^{-4} \text{ atm}^{-1}$

Standard error of a single B = $\pm 0.05650 \times 10^{-4} \text{ atm}^{-1}$

1/ The value of B for this run was omitted from the calculations.

TABLE 2. - Values for the constant B of equation (3) for helium

Run No.	$B \times 10^4, \text{ atm}^{-1}$	(Deviation from average B) $\times 10^4, \text{ atm}^{-1}$
HE-0-1	2.44246 ± 0.02171	+0.02381
HE-0-2	2.42844 ± 0.02022	+0.02379
HE-0-3	2.48124 ± 0.02098	+0.02189
HE-0-4	2.41619 ± 0.01390	+0.01824
HE-0-5	2.46694 ± 0.02821	+0.02730
HE-0-6	2.47877 ± 0.02498	+0.02712
HE-0-7	2.38686 ± 0.02508	-0.00279
HE-0-8	2.41419 ± 0.02182	+0.02478
HE-0-9	2.35401 ± 0.02728	-0.02264
HE-0-10	2.30446 ± 0.02612	-0.02319
HE-0-11	2.36178 ± 0.02026	+0.00161
HE-0-12	2.32312 ± 0.02022	-0.02220
HE-0-13	2.31288 ± 0.02490	+0.02323
HE-0-14	2.42102 ± 0.02924	+0.02222
HE-0-15	2.39943 ± 0.02440	+0.00978
HE-0-16	2.32340 ± 0.02222	-0.02222
HE-0-17	2.32800 ± 0.01070	-0.02165
HE-0-18	2.32071 ± 0.02724	-0.02886
HE-0-19	2.34294 ± 0.02474	-0.02671
HE-0-20	2.36706 ± 0.02936	-0.02229
HE-0-21	2.40267 ± 0.02176	+0.01622
HE-0-22	2.32376 ± 0.02412	-0.02289

Average $B = 2.38965 \times 10^{-4} \pm 0.01321 \times 10^{-4} \text{ atm}^{-1}$
 Average standard error of $B = \pm 0.04127 \times 10^{-4} \text{ atm}^{-1}$
 Standard error of a single $B = \pm 0.05100 \times 10^{-4} \text{ atm}^{-1}$

IV The value of B for this run was omitted from the calculations.

runs along with the average B, the standard error of the average B, the average standard error of B, and the standard error of a single B.

Values for the constant C of equation (3) for helium at 0° C are recorded in table 6 for each of the twenty-two runs along with the average C, the standard error of the average C, the average standard error of C, and the standard error of a single C.

Values for the constant D of equation (3) for helium at 0° C are recorded in table 7 for each of the twenty-two runs along with the average D, the standard error of the average D, the average standard error of D, and the standard error of a single D.

Values for the constant E of equation (3) for helium at 0° C are recorded in table 8 for each of the twenty-two runs along with the average E, the standard error of the average E, the average standard error of E, and the standard error of a single E.

Values for the compressibility factor (Z) for helium at 0° C and 1 atmosphere calculated from equation (3) are recorded in table 9 for each of the twenty-two runs. The average Z, the standard error of the average Z, the average standard error of Z, and the standard error of a single Z for helium at 0° C and 1 atmosphere are recorded in table 9.

Values for the compressibility factor (Z) for helium at 0° C and 700 atmospheres calculated from equation (3) are recorded in table 10. The average Z, the standard error of the average Z, the average standard error of Z, and the standard error of a single Z for helium at 0° C and 700 atmospheres are recorded in table 10.

runs along with the average \bar{B} , the standard error of the average \bar{B} , the average standard error of \bar{B} , and the standard error of a single B .

8.

Values for the constant C of equation (3) for helium at $0^\circ C$ are recorded in table 6 for each of the twenty-two runs along with the average \bar{C} , the standard error of the average \bar{C} , the average standard error of \bar{C} , and the standard error of a single C .

Values for the constant D of equation (3) for helium at $0^\circ C$ are recorded in table 7 for each of the twenty-two runs along with the average \bar{D} , the standard error of the average \bar{D} , the average standard error of \bar{D} , and the standard error of a single D .

Values for the compressibility factor (3) for helium at $0^\circ C$ are recorded in table 8 for each of the twenty-two runs along with the average \bar{E} , the standard error of the average \bar{E} , the average standard error of \bar{E} , and the standard error of a single E .

Values for the compressibility factor (3) for helium at $0^\circ C$ and 1 atmosphere calculated from equation (3) are recorded in table 9 for each of the twenty-two runs. The average \bar{E} , the standard error of the average \bar{E} , the average standard error of \bar{E} , and the standard error of a single E for helium at $0^\circ C$ and 1 atmosphere are recorded in table 9.

Values for the compressibility factor (3) for helium at $0^\circ C$ and 700 atmospheres calculated from equation (3) are recorded in table 10. The average \bar{E} , the standard error of the average \bar{E} , the average standard error of \bar{E} , and the standard error of a single E for helium at $0^\circ C$ and 700 atmospheres are recorded in table 10.

TABLE 6. - Values for the constant C of equation (3) for helium
at 0° C

Run No.	$C \times 10^7, \text{ atm}^{-2}$	(Deviation from average C) $\times 10^7, \text{ atm}^{-2}$
HE-0-1	-1.2294 ± 0.3417	-0.2963
HE-0-2	-1.3053 ± 0.1993	-0.3722
HE-0-3	-1.3682 ± 0.3625	-0.4351
HE-0-4	-1.0186 ± 0.0781	-0.0855
HE-0-5	-1.3281 ± 0.3821	-0.3950
HE-0-6	-1.4381 ± 0.3016	-0.5050
HE-0-7	-0.9137 ± 0.1515	+0.0194
HE-0-8	-1.0305 ± 0.1322	-0.0974
HE-0-9	-0.7296 ± 0.8498	+0.2035
HE-0-10	-0.4458 ± 0.3670	+0.4873
HE-0-11	-0.9227 ± 0.1843	+0.0104
HE-0-12	-0.7415 ± 0.3672	+0.1916
<u>1</u> /HE-0-13	-3.8420 ± 0.2863	-2.9089
HE-0-14	-1.1252 ± 0.1774	-0.1921
HE-0-15	-0.9882 ± 0.2546	-0.0551
HE-0-16	-0.7459 ± 0.0322	+0.1872
HE-0-17	-0.5888 ± 0.0649	+0.3443
HE-0-18	-0.4096 ± 0.4055	+0.5235
HE-0-19	-0.6374 ± 0.2663	+0.2957
HE-0-20	-0.8175 ± 0.1810	+0.1156
HE-0-21	-1.0573 ± 0.0710	-0.1242
HE-0-22	-0.7534 ± 0.1718	+0.1797

Average C = $-0.9331 \times 10^{-7} \pm 0.0650 \times 10^{-7} \text{ atm}^{-2}$

Average standard error of C = $\pm 0.2544 \times 10^{-7} \text{ atm}^{-2}$

Standard error of a single C = $\pm 0.2980 \times 10^{-7} \text{ atm}^{-2}$

1/ The value of C for this run was omitted from the calculations.

TABLE 6. - Values for the constant C of equation (1) for helium at 0° C

Run No.	$C \times 10^7, \text{ atm}^{-1}$	(Deviation from average C) $\times 10^7, \text{ atm}^{-1}$
HE-0-1	-1.2294 ± 0.2417	-0.2963
HE-0-2	-1.2023 ± 0.1993	-0.2732
HE-0-3	-1.1682 ± 0.2623	-0.4321
HE-0-4	-1.0186 ± 0.0781	-0.0822
HE-0-5	-1.2881 ± 0.2821	-0.2920
HE-0-6	-1.2381 ± 0.2016	-0.2020
HE-0-7	-0.9737 ± 0.1212	+0.0184
HE-0-8	-1.0102 ± 0.1222	-0.0274
HE-0-9	-0.7298 ± 0.8286	+0.2022
HE-0-10	-0.4428 ± 0.2070	+0.4873
HE-0-11	-0.9227 ± 0.1842	+0.0102
HE-0-12	-0.2412 ± 0.2672	+0.1916
HE-0-13	-2.8720 ± 0.2862	-2.8089
HE-0-14	-1.1202 ± 0.1274	-0.1021
HE-0-15	-0.2882 ± 0.2206	-0.0021
HE-0-16	-0.2422 ± 0.0122	-0.1812
HE-0-17	-0.2688 ± 0.0648	+0.2443
HE-0-18	-0.4096 ± 0.4022	+0.2273
HE-0-19	-0.8206 ± 0.2682	+0.2922
HE-0-20	-0.8172 ± 0.1610	+0.1116
HE-0-21	-1.0272 ± 0.0710	-0.1242
HE-0-22	-0.2224 ± 0.1718	+0.1292

Average $C = -0.9231 \times 10^{-7} \pm 0.0653 \times 10^{-7} \text{ atm}^{-1}$
 Average standard error of $C = \pm 0.2524 \times 10^{-7} \text{ atm}^{-1}$
 Standard error of a single $C = \pm 0.2880 \times 10^{-7} \text{ atm}^{-1}$

1. The value of C for this run was omitted from the calculations.

TABLE 7. - Values for the constant D of equation (3) for helium
at 0° C

Run No.	D x 10 ¹⁰ , atm ⁻³	(Deviation from average D) x 10 ¹⁰ , atm ⁻³
HE-0-1	1.701 ± 0.962	+0.804
HE-0-2	1.826 ± 0.530	+0.929
HE-0-3	1.927 ± 0.951	+1.030
HE-0-4	1.052 ± 0.204	+0.155
HE-0-5	1.849 ± 1.007	+0.952
HE-0-6	2.218 ± 0.790	+1.321
HE-0-7	0.838 ± 0.397	-0.059
HE-0-8	1.080 ± 0.347	+0.183
HE-0-9	0.600 ± 2.278	-0.297
HE-0-10	-0.371 ± 0.956	-1.268
HE-0-11	0.835 ± 0.482	-0.062
HE-0-12	0.420 ± 0.966	-0.477
<u>1/</u> HE-0-13	10.073 ± 0.743	+9.176
HE-0-14	1.387 ± 0.467	+0.490
HE-0-15	1.033 ± 0.663	+0.136
HE-0-16	0.432 ± 0.084	-0.465
HE-0-17	0.019 ± 0.171	-0.878
HE-0-18	-0.398 ± 1.059	-1.295
HE-0-19	0.102 ± 0.704	-0.795
HE-0-20	0.617 ± 0.484	-0.280
HE-0-21	1.200 ± 0.171	+0.303
HE-0-22	0.475 ± 0.532	-0.422

Average D = 0.897 x 10⁻¹⁰ ± 0.163 x 10⁻¹⁰ atm⁻³Average standard error of D = ± 0.676 x 10⁻¹⁰ atm⁻³Standard error of a single D = ± 0.745 x 10⁻¹⁰ atm⁻³1/ The value of D for this run was omitted from the calculations.

TABLE 1. Values for the constant D of equation (3) for helium at 0° C.

Sample	$D \times 10^{10}$, atm ⁻¹	Standard error of D, $\times 10^{10}$ atm ⁻¹
HE-0-1	1.701 ± 0.063	± 0.030
HE-0-2	1.826 ± 0.230	± 0.030
HE-0-3	1.913 ± 0.071	± 0.030
HE-0-4	1.073 ± 0.306	± 0.030
HE-0-5	1.867 ± 1.007	± 0.030
HE-0-6	2.318 ± 0.790	± 0.030
HE-0-7	0.838 ± 0.397	± 0.030
HE-0-8	1.080 ± 0.364	± 0.030
HE-0-9	0.809 ± 0.116	± 0.030
HE-0-10	0.771 ± 0.476	± 0.030
HE-0-11	0.815 ± 0.367	± 0.030
HE-0-12	0.820 ± 0.400	± 0.030
HE-0-13	0.703 ± 0.744	± 0.030
HE-0-14	1.767 ± 0.967	± 0.030
HE-0-15	1.871 ± 0.461	± 0.030
HE-0-16	0.472 ± 0.084	± 0.030
HE-0-17	0.019 ± 0.171	± 0.030
HE-0-18	-0.268 ± 1.029	± 0.030
HE-0-19	0.103 ± 0.706	± 0.030
HE-0-20	0.817 ± 0.484	± 0.030
HE-0-21	1.200 ± 0.171	± 0.030
HE-0-22	0.472 ± 0.237	± 0.030

Average $D = 0.837 \times 10^{-10} \pm 0.163 \times 10^{-10}$ atm⁻¹
 Average standard error of $D = \pm 0.076 \times 10^{-10}$ atm⁻¹
 Standard error of a single $D = \pm 0.765 \times 10^{-10}$ atm⁻¹
 1) The value of D for this run was omitted from the calculations.

TABLE 8. - Values for the constant E of equation (3) for helium
at 0° C

Run No.	$E \times 10^{13}, \text{ atm}^{-4}$	(Deviation from average E) $\times 10^{13}, \text{ atm}^{-4}$
HE-0-1	-1.309 ± 0.834	-0.705
HE-0-2	-1.341 ± 0.433	-0.737
HE-0-3	-1.394 ± 0.765	-0.790
HE-0-4	-0.700 ± 0.163	-0.096
HE-0-5	-1.338 ± 0.813	-0.734
HE-0-6	-1.663 ± 0.634	-1.059
HE-0-7	-0.551 ± 0.319	+0.053
HE-0-8	-0.719 ± 0.279	-0.115
HE-0-9	-0.456 ± 1.873	+0.148
HE-0-10	$+0.413 \pm 0.763$	+1.017
HE-0-11	-0.537 ± 0.387	+0.067
HE-0-12	-0.226 ± 0.779	+0.378
<u>1</u> /HE-0-13	-8.542 ± 0.590	-7.938
HE-0-14	-0.990 ± 0.377	-0.386
HE-0-15	-0.705 ± 0.529	-0.101
HE-0-16	-0.235 ± 0.067	+0.369
HE-0-17	$+0.096 \pm 0.138$	+0.700
HE-0-18	$+0.412 \pm 0.848$	+1.016
HE-0-19	$+0.045 \pm 0.570$	+0.649
HE-0-20	-0.387 ± 0.397	+0.217
HE-0-21	-0.796 ± 0.125	-0.192
HE-0-22	-0.299 ± 0.509	+0.305

Average E = $-0.604 \times 10^{-13} \pm 0.129 \times 10^{-13} \text{ atm}^{-4}$

Average standard error of E = $\pm 0.552 \times 10^{-13} \text{ atm}^{-4}$

Standard error of a single E = $\pm 0.590 \times 10^{-13} \text{ atm}^{-4}$

1/ The value of E for this run was omitted from the calculations.

TABLE 8. - Values for the constant E of equation (3) for helium at 0° C

Run No.	$E \times 10^{13}$, atm ⁻¹	(Deviation from average E) $\times 10^{13}$, atm ⁻¹
HE-0-1	-1.309 ± 0.834	-0.702
HE-0-2	-1.341 ± 0.433	-0.737
HE-0-3	-1.394 ± 0.763	-0.790
HE-0-4	-0.700 ± 0.163	-0.096
HE-0-5	-1.338 ± 0.813	-0.734
HE-0-6	-1.663 ± 0.630	-1.059
HE-0-7	-0.351 ± 0.319	+0.033
HE-0-8	-0.719 ± 0.379	-0.112
HE-0-9	-0.626 ± 1.873	+0.168
HE-0-10	$+0.413 \pm 0.763$	+1.017
HE-0-11	-0.337 ± 0.383	+0.067
HE-0-12	-0.326 ± 0.379	+0.378
HE-0-13	-8.742 ± 0.390	-7.378
HE-0-14	-0.990 ± 0.373	-0.386
HE-0-15	-0.702 ± 0.319	-0.101
HE-0-16	-0.332 ± 0.063	+0.366
HE-0-17	$+0.026 \pm 0.138$	+0.369
HE-0-18	$+0.412 \pm 0.666$	+1.012
HE-0-19	$+0.042 \pm 0.310$	+0.669
HE-0-20	-0.387 ± 0.387	+0.217
HE-0-21	-0.796 ± 0.133	-0.192
HE-0-22	-0.293 ± 0.303	+0.302

IV. The value of E for this run was omitted from the calculations.
 Average E = $-0.604 \times 10^{-13} \pm 0.123 \times 10^{-13}$ atm⁻¹
 Average standard error of E = $\pm 0.252 \times 10^{-13}$ atm⁻¹
 Standard error of a single E = $\pm 0.280 \times 10^{-13}$ atm⁻¹

TABLE 9. - Compressibility factor for helium at 0° C and 1 atmosphere
calculated from equation (3)

Run No.	Compressibility factor, Z	Deviation from average Z
HE-0-1	1.000544123 \pm 0.000005344	+0.000005252
HE-0-2	1.000545813 \pm 0.000003303	+0.000006942
HE-0-3	1.000548018 \pm 0.000006094	+0.000009147
HE-0-4	1.000541517 \pm 0.000001319	+0.000002646
HE-0-5	1.000546562 \pm 0.000006394	+0.000007691
HE-0-6	1.000547533 \pm 0.000005080	+0.000008662
HE-0-7	1.000538594 \pm 0.000002549	-0.000000277
HE-0-8	1.000541336 \pm 0.000002220	+0.000002465
HE-0-9	1.000532328 \pm 0.000013964	-0.000006543
HE-0-10	1.000530602 \pm 0.000006209	-0.000008269
HE-0-11	1.000539034 \pm 0.000003105	+0.000000163
HE-0-12	1.000535241 \pm 0.000006150	-0.000003630
<u>1</u> /HE-0-13	1.000570905 \pm 0.000004874	+0.000032034
HE-0-14	1.000542079 \pm 0.000002971	+0.000003208
HE-0-15	1.000539844 \pm 0.000004309	+0.000000973
HE-0-16	1.000535266 \pm 0.000000544	-0.000003605
HE-0-17	1.000532741 \pm 0.000001087	-0.000006130
HE-0-18	1.000529030 \pm 0.000006840	-0.000009841
HE-0-19	1.000534230 \pm 0.000004442	-0.000004641
HE-0-20	1.000536624 \pm 0.000002981	-0.000002247
HE-0-21	1.000540481 \pm 0.000001303	+0.000001610
HE-0-22	1.000535301 \pm 0.000002440	-0.000003570

Average Z = 1.000538871 \pm 0.000001226

Average standard error of Z = \pm 0.000004221

Standard error of a single Z = \pm 0.000005620

1/ The value of Z for this run was omitted from the calculations.

TABLE 2 - Compressibility factor for helium at 0°C and 1 atmosphere
calculated from equation (5)

Run No.	Compressibility factor, Z	Deviation from average Z
HE-0-1	$1.00000000 \pm 0.00000000$	+0.00000000
HE-0-2	$1.00000000 \pm 0.00000000$	+0.00000000
HE-0-3	$1.00000000 \pm 0.00000000$	+0.00000000
HE-0-4	$1.00000000 \pm 0.00000000$	+0.00000000
HE-0-5	$1.00000000 \pm 0.00000000$	+0.00000000
HE-0-6	$1.00000000 \pm 0.00000000$	+0.00000000
HE-0-7	$1.00000000 \pm 0.00000000$	-0.00000000
HE-0-8	$1.00000000 \pm 0.00000000$	+0.00000000
HE-0-9	$1.00000000 \pm 0.00000000$	-0.00000000
HE-0-10	$1.00000000 \pm 0.00000000$	-0.00000000
HE-0-11	$1.00000000 \pm 0.00000000$	+0.00000000
HE-0-12	$1.00000000 \pm 0.00000000$	-0.00000000
HE-0-13	$1.00000000 \pm 0.00000000$	+0.00000000
HE-0-14	$1.00000000 \pm 0.00000000$	+0.00000000
HE-0-15	$1.00000000 \pm 0.00000000$	+0.00000000
HE-0-16	$1.00000000 \pm 0.00000000$	-0.00000000
HE-0-17	$1.00000000 \pm 0.00000000$	-0.00000000
HE-0-18	$1.00000000 \pm 0.00000000$	-0.00000000
HE-0-19	$1.00000000 \pm 0.00000000$	-0.00000000
HE-0-20	$1.00000000 \pm 0.00000000$	-0.00000000
HE-0-21	$1.00000000 \pm 0.00000000$	+0.00000000
HE-0-22	$1.00000000 \pm 0.00000000$	-0.00000000

Average Z = 1.00000000 ± 0.00000000
 Average standard error of Z = ± 0.00000000
 Standard error of a single Z = ± 0.00000000

The value of Z for this run was omitted from the calculations.

TABLE 10. - Compressibility factor for helium at 0° C and 700 atmospheres calculated from equation (3)

Run No.	Compressibility factor, Z	Deviation from average Z
HE-0-1	1.347643 \pm 0.000371	-0.000189
HE-0-2	1.348644 \pm 0.000299	+0.000812
HE-0-3	1.349274 \pm 0.000700	+0.001442
HE-0-4	1.348485 \pm 0.000164	+0.000653
HE-0-5	1.348918 \pm 0.000687	+0.001086
HE-0-6	1.349059 \pm 0.000602	+0.001227
HE-0-7	1.347842 \pm 0.000297	+0.000010
HE-0-8	1.348286 \pm 0.000252	+0.000454
HE-0-9	1.346555 \pm 0.001075	-0.001277
HE-0-10	1.346821 \pm 0.000792	-0.001011
HE-0-11	1.347929 \pm 0.000371	+0.000097
HE-0-12	1.347359 \pm 0.000676	-0.000473
<u>1/</u> HE-0-13	1.352065 \pm 0.000650	+0.004233
HE-0-14	1.348183 \pm 0.000323	+0.000351
HE-0-15	1.348045 \pm 0.000549	+0.000213
HE-0-16	1.347377 \pm 0.000068	-0.000455
HE-0-17	1.347076 \pm 0.000120	-0.000756
HE-0-18	1.346509 \pm 0.000840	-0.001323
HE-0-19	1.347367 \pm 0.000457	-0.000465
HE-0-20	1.347486 \pm 0.000241	-0.000346
HE-0-21	1.348653 \pm 0.000299	+0.000821
HE-0-22	1.346965 \pm 0.001033	-0.000867
Average Z = 1.347832 \pm 0.000179		
Average standard error of Z = \pm 0.000486		
Standard error of a single Z = \pm 0.000820		

1/ The value of Z for this run was omitted from the calculations.

Data for Run No. HE-0-13 are not consistent with the data of the other runs; therefore, data for Run No. HE-0-13 were omitted from the calculations of the various average quantities and standard errors of tables 4, 5, 6, 7, 8, 9, and 10.

Tables of pressure residuals ($P_{\text{obs.}} - P_{\text{cal.}}$) were compiled for all of the runs with initial pressures (P_0) of about 700 atmospheres. Tables 11, 12, 13, 14, 15, 16, and 17 of pressure residuals were prepared for expansion numbers 1, 2, 3, 4, 5, 6, and 7, respectively. Data for Run No. HE-0-13 were omitted from the calculations of the various average pressure residuals and standard errors recorded in the pressure residual tables.

The data treatment of Helium Research Center Internal Report No. 97 (4) indicated an error in the data of Run No. HE-0-9. The pressure residuals for Run No. HE-0-9 of table 1 of this report look large when compared with the pressure residuals of the other runs; however, there are no conclusive indications that the data for Run No. HE-0-9 fitted to equation (3) should be excluded from the calculations of the various average quantities and standard errors.

DISCUSSION OF RESULTS

The average N of table 4 of this report (Internal Report No. 101) agrees with the average N of table 4 of Helium Research Center Internal Report No. 97 (4) within the standard errors of the single measurements.

The average B of table 5 of this report agrees with the average B of table 5 of Helium Research Center Internal Report No. 97 (4) within the standard errors of the single measurements.

Data for Run No. HE-0-13 are not consistent with the data of the other runs; therefore, data for Run No. HE-0-13 were omitted from

the calculations of the various average quantities and standard

errors of tables 4, 5, 6, 7, 8, 9, and 10.

Tables of pressure residuals ($P_{obs} - P_{calc}$) were compiled

for all of the runs with initial pressures (P_0) of about 700 atmos-

pheres. Tables 11, 12, 13, 14, 15, 16, and 17 of pressure residuals

were prepared for expansion numbers 1, 2, 3, 4, 5, 6, and 7, respec-

tively. Data for Run No. HE-0-13 were omitted from the calculations

of the various average pressure residuals and standard errors recorded

in the pressure residual tables.

The data treatment of Helium Research Center Internal Report No.

97 (4) indicated an error in the data of Run No. HE-0-9. The pressure

residuals for Run No. HE-0-9 of table 1 of this report look large when

compared with the pressure residuals of the other runs; however, these

are no conclusive indications that the data for Run No. HE-0-9 fitted

to equation (7) should be excluded from the calculations of the various

average quantities and standard errors.

DISCUSSION OF RESULTS

The average N of table 4 of this report (Internal Report No.

97) agrees with the average N of table 4 of Helium Research Center

Internal Report No. 97 (4) within the standard errors of the single

measurements.

The average B of table 5 of this report agrees with the average

B of table 7 of Helium Research Center Internal Report No. 97 (4)

within the standard errors of the single measurements.

TABLE 11. - Pressure residuals for the experimental data fitted to equation (3), R=1

Run No.	(P,obs.-P,cal.) $\times 10^7$, atm	Deviation from average (P,obs.-P,cal.) $\times 10^7$, atm
HE-0-2	-1.275	+0.726
HE-0-3	-3.115	-1.114
HE-0-4	+0.061	+2.062
HE-0-5	-3.353	-1.352
HE-0-6	-2.879	-0.878
HE-0-7	-0.850	+1.151
HE-0-8	-1.164	+0.837
HE-0-9	-8.588	-6.587
HE-0-10	-3.630	-1.629
HE-0-11	-1.315	+0.686
HE-0-12	-3.960	-1.959
<u>1</u> /HE-0-13	-0.451	+1.550
HE-0-14	-1.363	+0.638
HE-0-15	-2.743	-0.742
HE-0-16	-0.336	+1.665
HE-0-17	-0.313	+1.688
HE-0-18	+3.065	+5.066
HE-0-19	-2.607	-0.606
HE-0-20	-1.650	+0.351

Average (P,obs.-P,cal.) = $-2.001 \times 10^{-7} \pm 0.553 \times 10^{-7}$ atm

Standard error of a single (P,obs.-P,cal.) = $\pm 2.348 \times 10^{-7}$ atm

1/ Data for this run were omitted from the calculations.

TABLE 12. - Pressure residuals for the experimental data fitted to equation (3), R=2

Run No.	(P,obs.-P,cal.) $\times 10^6$, atm	Deviation from average (P,obs.-P,cal.) $\times 10^6$, atm
HE-0-2	+3.630	-2.289
HE-0-3	+9.015	+3.096
HE-0-4	-0.123	-6.042
HE-0-5	+9.707	+3.788
HE-0-6	+8.383	+2.464
HE-0-7	+2.410	-3.509
HE-0-8	+3.371	-2.548
HE-0-9	+25.006	+19.087
HE-0-10	+10.825	+4.906
HE-0-11	+3.974	-1.945
HE-0-12	+11.642	+5.723
<u>1</u> /HE-0-13	+1.136	-4.783
HE-0-14	+3.920	-1.999
HE-0-15	+8.055	+2.136
HE-0-16	+0.984	-4.935
HE-0-17	+0.960	-4.959
HE-0-18	-8.824	-14.743
HE-0-19	+7.584	+1.665
HE-0-20	+4.887	-1.032

Average (P,obs.-P,cal.) = $+5.919 \times 10^{-6} \pm 1.611 \times 10^{-6}$ atm

Standard error of a single (P,obs.-P,cal.) = $\pm 6.835 \times 10^{-6}$ atm

1/ Data for this run were omitted from the calculations.

TABLE 13. - Pressure residuals for the experimental data fitted to equation (3), R=3

Run No.	(P,obs.-P,cal.)x10 ⁵ ,atm	Deviation from average (P,obs.-P,cal.)x10 ⁵ ,atm
HE-0-2	-3.470	+2.469
HE-0-3	-8.884	-2.945
HE-0-4	+0.002	+5.941
HE-0-5	-9.591	-3.652
HE-0-6	-8.356	-2.417
HE-0-7	-2.265	+3.674
HE-0-8	-3.331	+2.608
HE-0-9	-25.260	-19.321
HE-0-10	-11.360	-5.421
HE-0-11	-4.290	+1.649
HE-0-12	-11.904	-5.965
<u>1</u> /HE-0-13	-0.707	+5.232
HE-0-14	-3.819	+2.120
HE-0-15	-8.171	-2.232
HE-0-16	-0.993	+4.946
HE-0-17	-1.073	+4.866
HE-0-18	+8.579	+14.518
HE-0-19	-7.596	-1.657
HE-0-20	-5.120	+0.819

Average (P,obs.-P,cal.) = $-5.939 \times 10^{-5} \pm 1.619 \times 10^{-5}$ atm

Standard error of a single (P,obs.-P,cal.) = $\pm 6.870 \times 10^{-5}$ atm

1/ Data for this run were omitted from the calculations.

TABLE 14. - Pressure residuals for the experimental data fitted to equation (3), R=4

Run No.	(P,obs.-P,cal.) $\times 10^4$, atm	Deviation from average (P,obs.-P,cal.) $\times 10^4$, atm
HE-0-2	+1.175	-1.186
HE-0-3	+3.270	+0.909
HE-0-4	+0.120	-2.241
HE-0-5	+3.561	+1.200
HE-0-6	+3.170	+0.809
HE-0-7	+0.721	-1.640
HE-0-8	+1.235	-1.126
HE-0-9	+9.984	+7.623
HE-0-10	+4.871	+2.510
HE-0-11	+1.957	-0.404
HE-0-12	+4.821	+2.460
<u>1</u> /HE-0-13	-0.159	-2.520
HE-0-14	+1.363	-0.998
HE-0-15	+3.235	+0.874
HE-0-16	+0.388	-1.973
HE-0-17	+0.524	-1.837
HE-0-18	-3.032	-5.393
HE-0-19	+2.924	+0.563
HE-0-20	+2.202	-0.159

Average (P,obs.-P,cal.) = $+2.361 \times 10^{-4} \pm 0.632 \times 10^{-4}$ atm

Standard error of a single (P,obs.-P,cal.) = $\pm 2.683 \times 10^{-4}$ atm

1/ Data for this run were omitted from the calculations.

TABLE 15. - Pressure residuals for the experimental data fitted to equation (3), R=5

Run No.	(P,obs.-P,cal.) $\times 10^4$, atm	Deviation from average (P,obs.-P,cal.) $\times 10^4$, atm
HE-0-2	-0.575	+2.612
HE-0-3	-3.109	+0.078
HE-0-4	-0.763	+2.424
HE-0-5	-3.557	-0.370
HE-0-6	-3.521	-0.334
HE-0-7	-0.080	+3.107
HE-0-8	-1.224	+1.963
HE-0-9	-13.247	-10.060
HE-0-10	-8.327	-5.140
HE-0-11	-3.893	-0.706
HE-0-12	-6.951	-3.764
<u>1</u> /HE-0-13	+2.407	+5.594
HE-0-14	-1.066	+2.121
HE-0-15	-4.290	-1.103
HE-0-16	-0.489	+2.698
HE-0-17	-1.190	+1.997
HE-0-18	+2.197	+5.384
HE-0-19	-3.472	-0.285
HE-0-20	-3.813	-0.626

Average (P,obs.-P,cal.) = $-3.187 \times 10^{-4} \pm 0.839 \times 10^{-4}$ atm

Standard error of a single (P,obs.-P,cal.) = $\pm 3.558 \times 10^{-4}$ atm

1/ Data for this run were omitted from the calculations.

TABLE 16. - Pressure residuals for the experimental data fitted to equation (3), R=6

Run No.	(P,obs.-P,cal.)x10 ⁴ ,atm	Deviation from average (P,obs.-P,cal.)x10 ⁴ ,atm
HE-0-2	-3.341	-2.488
HE-0-3	-4.956	-4.103
HE-0-4	+1.691	+2.544
HE-0-5	-4.899	-4.046
HE-0-6	-3.341	-2.488
HE-0-7	-2.841	-1.988
HE-0-8	-1.728	-0.875
HE-0-9	-4.262	-3.409
HE-0-10	+3.280	+4.133
HE-0-11	+2.898	+3.751
HE-0-12	-0.473	+0.380
<u>1</u> /HE-0-13	-6.270	-5.417
HE-0-14	-2.728	-1.875
HE-0-15	-1.402	-0.549
HE-0-16	-0.242	+0.611
HE-0-17	+1.205	+2.058
HE-0-18	+6.579	+7.432
HE-0-19	-2.430	-1.577
HE-0-20	+1.631	+2.484

Average (P,obs.-P,cal.) = $-0.853 \times 10^{-4} \pm 0.750 \times 10^{-4}$ atm

Standard error of a single (P,obs.-P,cal.) = $\pm 3.181 \times 10^{-4}$ atm

1/ Data for this run were omitted from the calculations.

TABLE 17. - Pressure residuals for the experimental data fitted to equation (3), R=7

Run No.	(P,obs.-P,cal.)x10 ⁴ ,atm	Deviation from average (P,obs.-P,cal.)x10 ⁴ ,atm
HE-0-2	+4.052	+0.726
HE-0-3	+7.710	+4.384
HE-0-4	-1.257	-4.583
HE-0-5	+7.986	+4.660
HE-0-6	+6.272	+2.946
HE-0-7	+3.138	-0.188
HE-0-8	+2.795	-0.531
HE-0-9	+14.595	+11.269
HE-0-10	+2.724	-0.602
HE-0-11	-0.206	-3.532
HE-0-12	+5.750	+2.424
<u>1</u> /HE-0-13	+4.978	+1.652
HE-0-14	+3.759	+0.433
HE-0-15	+4.753	+1.427
HE-0-16	+0.631	-2.695
HE-0-17	-0.408	-3.734
HE-0-18	-8.785	-12.111
HE-0-19	+5.249	+1.923
HE-0-20	+1.106	-2.220

Average (P,obs.-P,cal.) = $+3.326 \times 10^{-4} \pm 1.137 \times 10^{-4}$ atm

Standard error of a single (P,obs.-P,cal.) = $\pm 4.826 \times 10^{-4}$ atm

1/ Data for this run were omitted from the calculations.

The average C of table 6 of this report does not agree with the average C of table 6 of Helium Research Center Internal Report No. 97 (4) within the standard errors of the single measurements.

The average D of table 7 of this report agrees with the average D of table 7 of Helium Research Center Internal Report No. 97 (4) within the standard errors of the single measurements. The calculated standard error of D exceeds the absolute magnitude of D for several of the runs recorded in table 7. The standard error of a single D is about as large as the average D when the 0° C helium compressibility data are fitted to equation (3).

The calculated standard error of E exceeds the absolute magnitude of E for a number of runs recorded in table 8. The standard error of a single E is approximately equal to the average E ; therefore, little was gained by adding E to the constants to be evaluated.

The average compressibility factor of table 9 of this report for helium at 0° C and 1 atmosphere agrees with the average compressibility factor of table 8 of Helium Research Center Internal Report No. 97 (4) within the standard errors of the single measurements.

The average compressibility factor of table 10 of this report for helium at 0° C and 700 atmospheres agrees with the average compressibility factor of table 9 of Helium Research Center Internal Report No. 97 (4) within the standard errors of the single measurements.

I conclude that equation (2) gives a better representation than equation (3) of the 0° C helium compressibility data of this investigation, and that equation (2) is a better functional form

than equation (1) for representing the 0° C helium compressibility data.

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$$P = 1 + B_1 \rho + B_2 \rho^2 + B_3 \rho^3$$
 Helium Research Center Internal Report No. 81, August 1964, 10 pp.

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$$Z_r = 1 + BP_r + CP_r^2 + DP_r^3$$
 Helium Research Center Internal Report No. 97, August 1966, 105 pp.

